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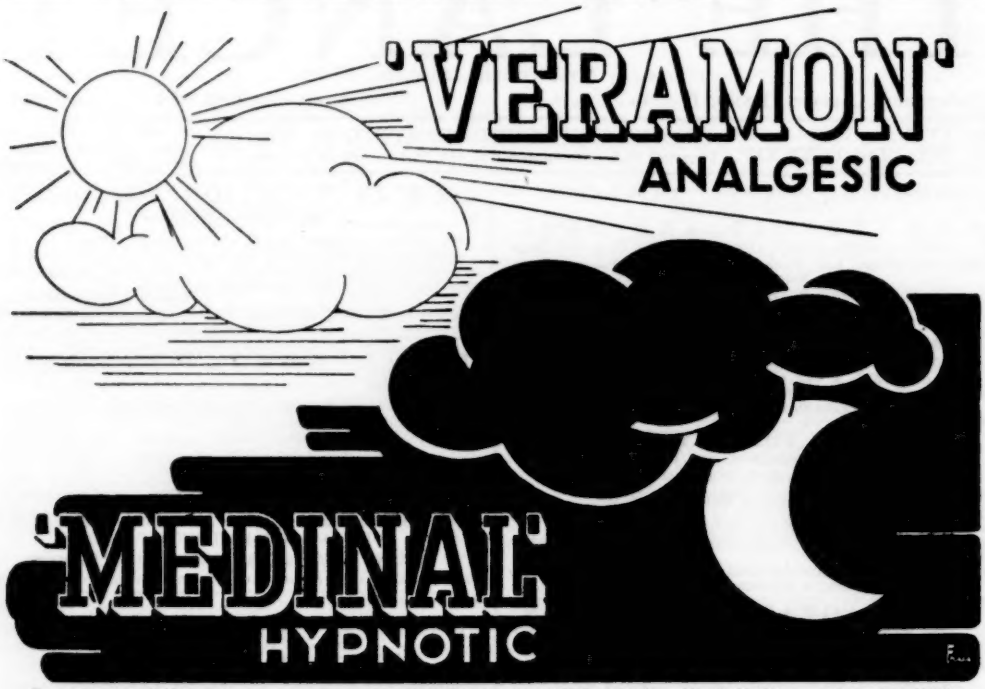

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ASSISTANT PHYSICIAN, ROYAL VICTORIA INFIRMARY, NEWCASTLE-UPON-TYNE: LEVERHULME RESEARCH SCHOLAR, ROYAL COLLEGE OF PHYSICIANS OF LONDON

II—NUTRITIONAL DEFICIENCY IN RELATION TO ANÆMIA

The recent great advances in our knowledge of this subject originated in the animal experiments of Whipple, the discovery of liver therapy by Minot and Murphy, and the clinical experiments of Castle. The anæmias of nutritional deficiency include a macrocytic group responding to substances effective in pernicious anæmia and a hypochromic group responding to iron. The macrocytic anæmias are characterised by a defect in cell production, while in the hypochromic anæmias hæmoglobin production is particularly at fault. Anæmia can also arise from a deficiency of vitamin C or of thyroxine.

Macrocytic Anæmias due to Deficiency of Substances Effective in Pernicious Anæmia

The normal individual obtains essential nutriment for blood regeneration from the interaction of an intrinsic factor in gastric juice and an extrinsic factor in food. The material which results from this interaction is absorbed from the intestine and stored in the liver and other organs. Addisonian pernicious anæmia arises chiefly from a deficiency of the gastric factor, but the syndrome of nutritional macrocytic anæmia may arise in other ways. Thus dietary deficiency is the prime cause of tropical macrocytic anæmias. Deficient absorption of preformed hæmopoietic material from the intestine or its destruction therein may contribute to the production of the macrocytic anæmia found in some cases of sprue, intestinal stricture, and multiple intestinal anastomoses. In pregnancy a latent partial deficiency may become manifest owing to the demand of the fœtus for hæmopoietic material. Disorder of the intermediate or internal metabolism of "liver extract" may perhaps occur and has been thought to account for the macrocytic anæmia of liver cirrhosis. Infection and arterio-sclerosis are sometimes contributing factors in the ætiology of nutritional anæmias.

Pernicious Anæmia

Attention has already been drawn to Samuel Fenwick's (1880) emphasis on the relationship of atrophy of the stomach to pernicious anæmia. Hurst and Bell (1922) stressed the essential unity of pernicious anæmia and subacute combined degeneration, and the almost uniform presence of achlorhydria. The defect in gastric secretion is of severe degree, but the essential feature is a deficiency of Castle's intrinsic factor. The work of Meulengracht (1935) suggests that in the pig this gastric factor is formed in the pyloric gland region and also in Brunner's glands in the duodenum, which are morphologically similar. Our own experiments confirm Meulengracht's dictum that pepsin and the anti-anæmic factor are dissociated physiologically and anatomically in the stomach. *Fundus* mucosa extracts contained pepsinogen but were hæmopoietically inactive when administered with a source of extrinsic factor. In extracts of *pylorus* mucosa on the other hand, pepsin and pepsinogen were absent or very slight in amount, but they were a good source of Castle's intrinsic factor (Ungley and Moffett 1936).

Magnus and Ungley (1938) have reported a histological study of the stomachs of 7 patients with pernicious anæmia who died during a relapse. In all cases a characteristic lesion was found, localised in its distribution to the region of the body (fundus) mucosa. The pyloric antrum and duodenum, where it has been assumed the intrinsic factor is produced, showed no pathological abnormality. There is, therefore, a morbid anatomical basis for the achylia gastrica found in pernicious anæmia but not for the absence of intrinsic factor if we assume that it is produced in the regions already stated. The lesion is an atrophic process affecting all coats of the stomach wall and from its histological appearances is almost certainly not the end-result of an inflammatory gastritis. From its nature it is unlikely that regeneration to normal gastric mucosa ever takes place.

The *cause* of this peculiar gastric lesion is unknown. The problem is linked with the causation of achlorhydria in normal persons and in idiopathic hypochromic anæmia, where gastric analysis often reveals a secretory defect just as severe as in pernicious anæmia. When one considers that at least 15 per cent. of normal individuals over 40 have anacidity (Bloomfield and Polland 1933) the number which gets pernicious anæmia is minute. The same authors (1935) have followed 45 patients with complete achlorhydria for periods varying up to seven years; in no case has evidence of pernicious anæmia developed. *Age* is important: the tendency to achlorhydria increases with age and so does the incidence of pernicious anæmia (see also Goldhamer 1937). Any explanation for the relationship of anacidity to pernicious anæmia must take into account the remarkable *racial* incidence of the disease. Pernicious anæmia is pre-eminently a disease of Northern Europe and North America. Chinese and full-blooded negroes appear to be almost if not quite exempt. The *hereditary and familial* aspects must also be considered. As an example I might mention a family in which 3 cases of subacute combined degeneration and 2 cases of pernicious anæmia occurred in two generations, and two of the four sons of one of them had achlorhydria (Ungley and Suzman 1929; see also Wilkinson and Brockbank 1931). Frank (1933) describes identical twins who developed pernicious anæmia within 1½ years of one another.

Pernicious anæmia is not uncommon in association with *endocrine disturbances* such as toxic goitre, myxœdema, and diabetes, in all of which a high incidence of achlorhydria has been noted. The association however may possibly be accidental (Wilkinson 1933). Recent work of Dodds and his associates (1934–37) suggests a possible relationship between the posterior lobe of the pituitary, achlorhydria, and hyperchromic anæmia. On the other hand, Snapper, Groen, Hunter, and Witts (1937) describe cases which seem to link pernicious anæmia with the anterior lobe of the pituitary.

The diet prior to the onset of pernicious anæmia has often been deficient. Is there any evidence that *dietary deficiency* may give rise to achlorhydria? Webster and Armour (1934) have shown that in dogs vitamins A, D, and C do not appear to be

* The Goulstonian lectures for 1938, delivered before the Royal College of Physicians of London on March 3rd, 8th, and 10th. Lect. I appeared in our last issue.

necessary for the proper functioning of the gastric glands. Achlorhydria is not a usual finding in human vitamin-A deficiency (Pillat and Chang 1932) or in beri-beri (Kitamura and Shimazono 1913). On the other hand, achlorhydria is extremely common in pellagra and a macrocytic anæmia may develop. Hellström et al. (1937) found achlorhydria more than three times as frequent in persons living on an unvaried lactocereal diet, deficient in the vitamin-B complex, as it was in those taking a larger variety of foodstuffs. On substituting the varied diet the achlorhydria usually disappeared. Miller and Rhoads (1935) report that feeding a canine-black-tongue-producing diet to swine led to achlorhydria, anæmia, and loss of the anti-pernicious-anæmia activity of the gastric secretion and liver. Nothing resembling the severe gastric atrophy present in pernicious anæmia has yet been produced by experimental diets. Nevertheless, the possibility exists that nutritional deficiency in prenatal or early postnatal life might give rise to lesions having a permanent effect on gastric secretion.

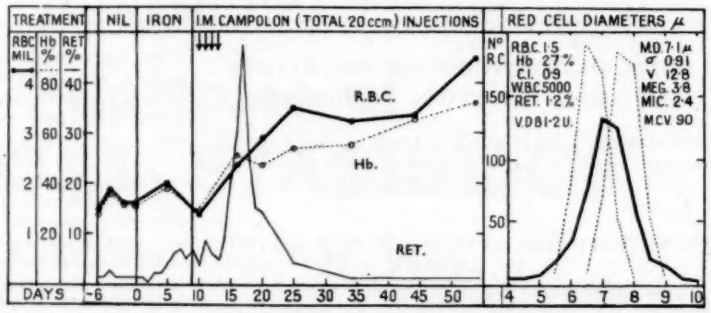


FIG. 1.—Illustrating the response to treatment in an anæmia due to dietary deficiency (see text). In this and the subsequent figures the thick line represents red blood-cells, the dotted line hæmoglobin, and the thin line reticulocytes.

To recapitulate: the cause of the gastric lesion in pernicious anæmia is unknown. Age, heredity, and endocrine factors almost certainly play a part in its production. The possible rôle of nutritional deficiency, perhaps arising in prenatal or neonatal life, needs to be borne in mind.

Complete removal of the stomach in man is followed by "pernicious anæmia" in a significant proportion of patients surviving the operation for a year or more. I have described a case in which "pernicious anæmia" developed within five months of complete gastrectomy and splenectomy (Ungley 1932). The association between pernicious and related anæmia and diseases of the stomach is of great interest, although the significance of the relationship is not always clear.

Of 9 cases of benign adenomatous gastric polyp (Ungley 1935) 6 had pernicious anæmia. In some patients gastric symptoms appeared first, in others anæmia was the first symptom. In one case the father had died from pernicious anæmia. The commonest site for the tumours was the pylorus. All patients except 2 were over fifty years of age. Achlorhydria was present in the 7 who had test-meals. No extensive histological studies similar to those of Magnus have been carried out, but it would seem that these polyps develop most commonly in the mucosa of stomachs which have undergone or are undergoing the pathological process which gives rise to achlorhydria and pernicious anæmia. The occasional association of pernicious anæmia with carcinoma of the stomach is probably fortuitous (Wilkinson 1933).

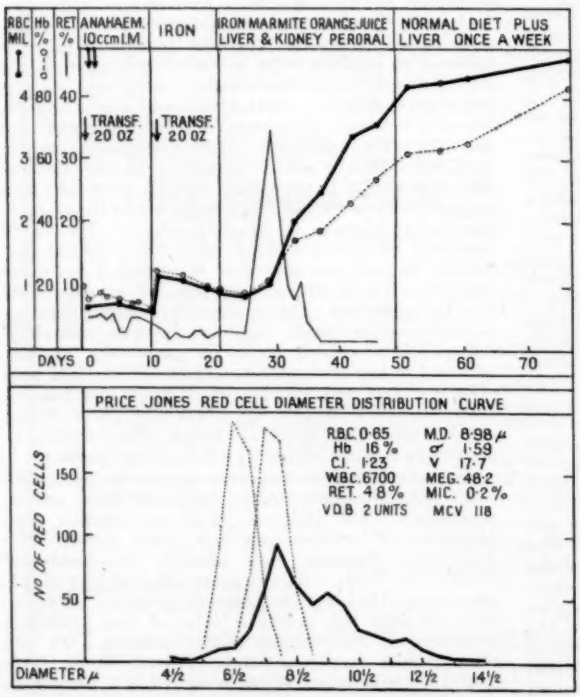


FIG. 3.—Hæmatological findings in a case of anæmia of pregnancy associated with vomiting and poor diet. The patient had suffered from hypochromic anæmia with achlorhydria after previous pregnancies. On this occasion the anæmia was macrocytic. After a normal confinement the anæmia became worse despite injections of campolon, and anahæmin was also without effect. Iron alone had no effect, but there was a prompt response to a high vitamin diet containing marmite, orange juice, liver, and kidney. Free hydrochloric acid was now present in the gastric juice.

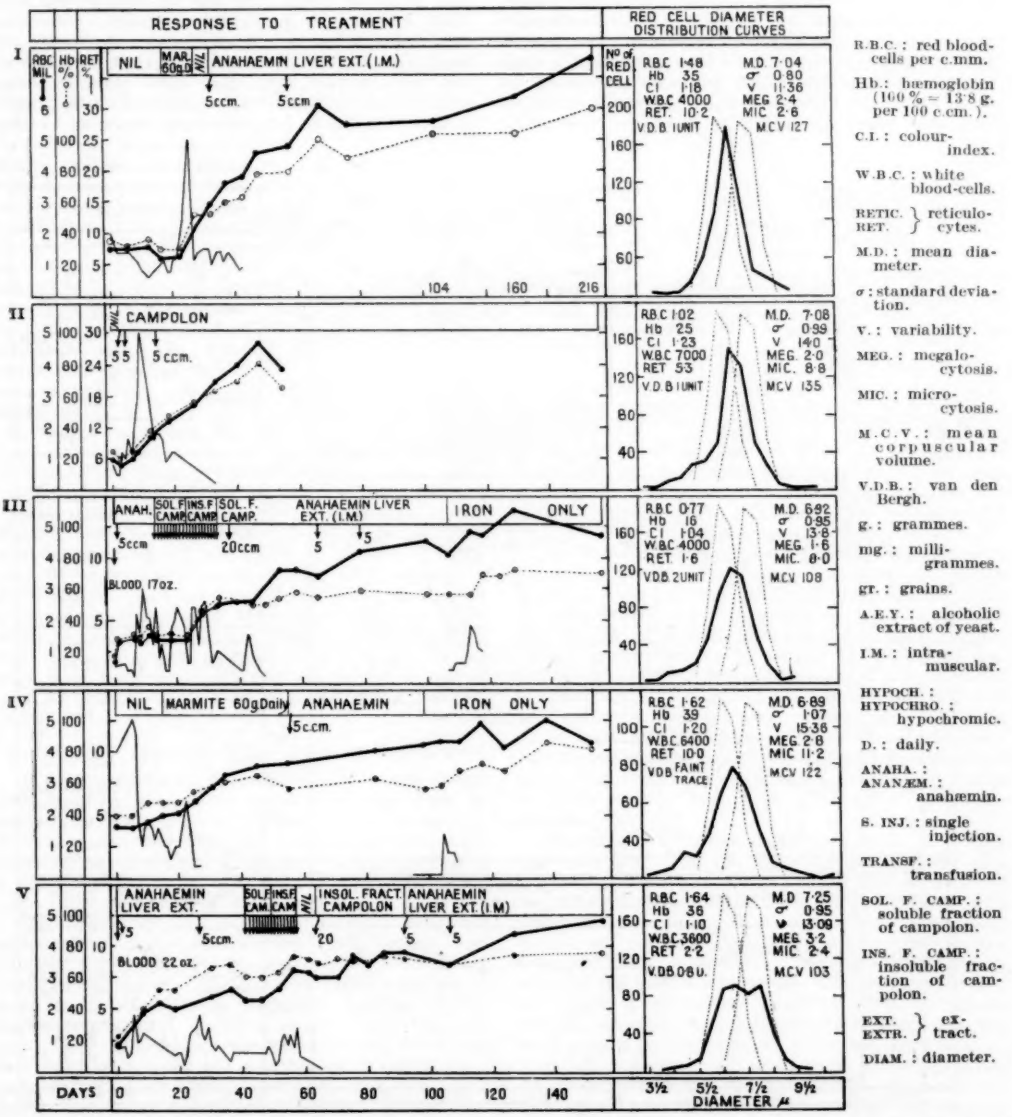
THE EXTRINSIC (FOOD) FACTOR

In 1929 Castle described experiments which indicated that beef muscle recovered from a normal stomach after digestion for one hour had an effect similar to liver when administered to patients with pernicious anæmia. After confirming this observation I showed that raw sheep's stomach possessed slight hæmopoietic activity (Ungley 1929). At the same time others used pig's stomach which proved to be more effective. The muscle layer of the stomach probably provides most of the extrinsic factor in whole desiccated hog's stomach, but even the mucosa itself is not entirely free from it (Castle and Ham 1936).

The idea that a substance associated with the vitamin-B complex might play a part in the ætiology of pernicious anæmia probably originated in the work of Lucy Wills (1931). In certain tropical anæmias, often arising

in pregnancy, and always associated with poor diets, Wills observed that autolysed yeast (Marmite) was as effective as liver extract. Later Strauss and Castle (1932) reported that autolysed yeast was a potent source of the extrinsic factor, which they suggested might be "vitamin B_2." My interest in the subject was aroused in 1930, when a reticulocytosis was observed during the administration of wheat-germ as a source of vitamin B_1 to a patient with subacute combined degeneration and pernicious anæmia. Although the reticulocytosis in this particular instance was almost certainly spontaneous, it was afterwards found that not only wheat-germ but also marmite and a 65 per cent. alcohol-soluble fraction of pressed brewer's yeast, when given in massive doses, induced a hæmopoietic response in some cases of Addisonian pernicious anæmia. Many of these patients had taken poor diets. Yeast extracts which influenced blood regeneration when given orally were inert when injected: to be effective, the active principle of yeast had to come in contact with intrinsic factor. In other words, the hæmopoietic effects observed were due not to a substance resembling liver extract but to Castle's extrinsic factor (Ungley 1933, Ungley and James 1934).

The presence of extrinsic factor in extracts of non-autolysed brewer's yeast has since been confirmed, using pylorus mucosa extracts as a source of the gastric factor. Activity attributable to the extrinsic



R.B.C.: red blood-cells per c.mm.
Hb.: hæmoglobin (100 % = 13·8 g. per 100 c.cm.).
C.I.: colour-index.
W.B.C.: white blood-cells.
RETIC. RET. } reticulocytes.
M.D.: mean diameter.
σ: standard deviation.
V.: variability.
MEG.: megalocytosis.
MIC.: microcytosis.
M.C.V.: mean corpuscular volume.
V.D.B.: van den Bergh.
g.: grammes.
mg.: milligrammes.
gr.: grains.
A.E.Y.: alcoholic extract of yeast.
I.M.: intramuscular.
HYPOCH.: HYPOCHRO.: hypochromic.
D.: daily.
ANAHA.: ANANÆM.: anahæmin.
S. INJ.: single injection.
TRANSF.: transfusion.
SOL. F. CAMP.: soluble fraction of campolon.
INS. F. CAMP.: insoluble fraction of campolon.
EXT. EXTR. } extract.
DIAM.: diameter.

FIG. 2.—Hæmatological findings and response to treatment in 5 cases of anæmia of pregnancy in whom there was a raised mean corpuscular volume but a normal mean diameter (see text)

factor has also been found in rice polishings (Castle 1933), eggs (Singer 1932, Miller and Rhoads 1934), and possibly tomatoes (Groen 1935) and milk (Miller and Pritchard 1937). Liver (Reimann 1931) and the liver fraction G of Cohn (Fouts and Zerfas 1933) contain in addition to the fully formed active principle a considerable amount of the extrinsic factor. Reimann, Hemmrich, and Steiner (1936) found the extrinsic factor in liver fractions which were free from protein or polypeptides, so that it is evidently not protein-like in nature.

As already mentioned, Strauss and Castle (1932) postulated that the extrinsic factor might be vitamin B_2. This theory was opposed by a number of workers. Ungley and James (1934) found that "vitamin-B_2 concentrates" prepared from yeast were relatively ineffective as a source of extrinsic factor, whereas a fraction of marmite administered subsequently gave an excellent response. The hæmopoietic potency of the extracts bore no relation to their content of a factor which prevents dermatitis in rats, since called vitamin B_6. The result indicates that the extrinsic factor is not the vitamin-B_6 component of the vitamin-B_2 complex. Birch, György, and Harris (1935) have pointed out that the distribution of vitamin B_6 and of lactoflavine in foodstuffs is different from that of Castle's extrinsic factor. Also included in vitamin-B_2 complex is the human pellagra-preventing factor, now known to be nicotinic acid, the distribution of which in foodstuffs appears to be similar to that of Castle's extrinsic factor. Nicotinic acid injections in a case of macrocytic anæmia and sprue-like diarrhœa were without hæmopoietic effect, while the same material given by mouth led to a reticulocytosis without a rise of red blood-cells (see Fig. 4). In patients with pernicious anæmia receiving normal gastric juice or pylorus mucosa extracts as a source of intrinsic factor the simultaneous administration of nicotinic acid or nicotinamide (330 mg. by mouth) was sometimes followed by a slight hæmopoietic response of doubtful significance; in other cases the results were clearly negative. The possibility that nicotinic acid and nicotinamide may play some part in hæmopoiesis is not yet excluded, but it is evident that neither of these substances is the extrinsic factor of Castle.

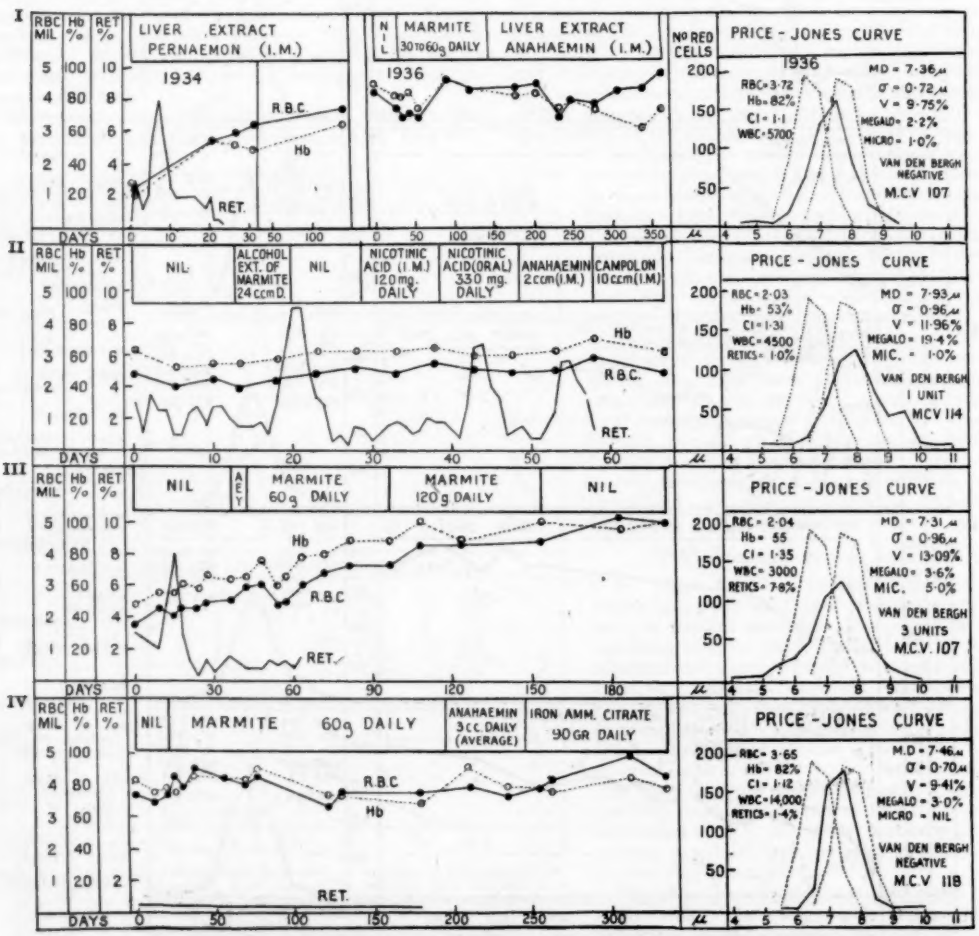


FIG. 4.—Hæmatological findings in 4 cases of idiopathic steatorrhœa. A raised mean corpuscular volume was present in each instance, but the mean diameter was normal in all except the second case (see text).

THE INTRINSIC FACTOR

The intrinsic factor is readily destroyed by heat—e.g., by boiling for five minutes, or by heating to 70°–80° C. for half an hour (Castle, Townsend, and Heath 1930). It is not identifiable with hydrochloric acid, pepsin, rennin, or lipase. We have recently shown that it is not pepsinogen. At the same time we disproved Greenspon's theory that the gastric anti-pernicious-anæmia factor is a hormone effective alone if protected from the action of pepsin: depepsinised gastric juice and pepsin-free extracts of pylorus mucosa had no significant hæmopoietic effect unless interaction with a source of extrinsic factor was allowed (Ungley and Moffett 1936). The precise conditions necessary for the interaction of the food and gastric factors are not known, and the synthesis of a thermostable product identical with the liver active principle has yet to be accomplished (see Castle, Heath, Strauss, and Heinle 1937).

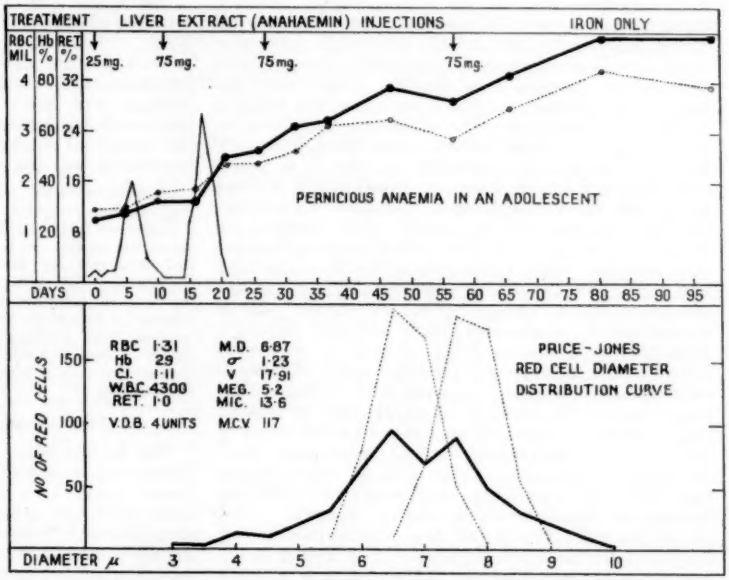


FIG. 5.—Hæmatological findings in a sexually immature girl aged 16. The clinical picture was that of pernicious anæmia with sore tongue and complete achlorhydria. There were no gastro-intestinal symptoms and the diet had not been grossly deficient. The mean corpuscular volume was raised (117 cubic micra) but the mean diameter was normal. Van den Bergh's indirect reaction 4 units. There was a tendency to hypochromia in the later stages of the remission induced by anahæmin.

Attempts to isolate the *liver principle* continue. By further purification of the product described by Dakin and West (1935) a peptide having twice the potency of the original fraction has been obtained (Ungley 1936, Dakin, Ungley, and West 1936). When given by mouth kidney is as potent as liver, and brain is about one-third as potent (Ungley 1931); yet fractions prepared from these organs by the technique used for making anahæmin showed no activity, suggesting that the active principle might differ from the liver factor. I have found, however, that the hæmopoietic potency of kidney is retained even after heating to 95°–100° C. for two hours, so that its activity cannot be due to Castle's intrinsic factor.

Macrocytic Anæmia from Dietary Deficiency

In work shortly to be published Wills has shown that tropical macrocytic anæmia usually fails to respond to highly purified extracts such as anahæmin. It would seem therefore that some mechanism other than deficiency of Castle's extrinsic factor is involved in the production of this anæmia (see also Wills, Clutterbuck, and Evans 1937).

Cases described as "pernicious anæmia with free hydrochloric acid" (see Alsted 1934, Groen and Snapper 1937) often have a long history of deficient food intake, and in some a hæmopoietic response to marmite or other source of Castle's extrinsic factor has been observed. I have already described two such cases: one patient was a widow aged 67, whose diet had been restricted because of epileptic fits; and the other a woman aged 39, with prolonged dietary deficiency due to dysphagia of the Plummer-Vinson type (Ungley 1933). A severe anæmia developed in a male epileptic aged 24, who restricted his diet chiefly to tea and white bread and butter-consuming almost no meat, eggs, fish, green vegetables, or fruit. A feature of the case was the Price, Jones curve, which showed considerably increased variability but a normal mean diameter. The mean corpuscular volume was in the upper limits of the normal range (90 cubic micra and, after iron, 99 cubic micra). Other findings are shown in Fig. 1.

The macrocytic anæmias of *pregnancy* form an important group. Five cases of interest are shown in Fig. 2. Sore mouth and vomiting occurred during pregnancy and often recommenced a few days after parturition. The diet had been poor both during the pregnancy and afterwards. In the third and fifth cases there was fever lasting about a week during the puerperium, apparently not due to sepsis, followed by further vomiting, sore tongue, and increasing pallor. In all these cases the mean corpuscular volume was raised but the mean diameter was normal. In a sixth case there was a Price-Jones curve similar to that usually found in Addisonian pernicious anæmia (Fig. 3).

Idiopathic steatorrhœa is another cause of macrocytic anæmia. The blood findings in 4 adults with fatty diarrhœa are shown in Fig. 4. The second case had the usual type of Price-Jones curve associated with macrocytic anæmia. The other three, although having an increased mean corpuscular volume, had a normal mean diameter. The fourth case, a man who had had gastro-enterostomy nine years previously, developed a sprue-like diarrhœa with nutritional œdema, anæmia, and hypochlorhydria; there was sometimes a leucocytosis (up to 18,000 per c.mm.).

In all the cases of nutritional anæmias above described, occurring in association with dietary deficiency, pregnancy, or idiopathic steatorrhœa, there was free hydrochloric acid in the gastric juice. Bone-marrow obtained by sternal puncture in a

few instances showed an erythroblastic activity often not of pernicious anæmia type. The results of van den Bergh's test and the total white cell count were much the same as in pernicious anæmia, and the tongue changes were similar. There were no nervous manifestations. In some cases the anæmia responded to marmite; in others to Campolon or to anahæmin. About half the cases later developed hypochromia which responded to iron. A factor common to 9 out of these 11 cases was a normal mean diameter (though with increased variability) in the presence of a raised mean corpuscular volume—that is, the cells were more spheroidal than normal. Such spherocytosis has been observed in malaria, and is well recognised in acholuric jaundice (Vaughan 1937). Fragility curves carried out in several of the pregnancy cases showed, however, little or no deviation from normal. A similar spherocytosis was present in two cases of macrocytic anæmia in young persons with achlorhydria. One was a small sexually immature girl of sixteen (Fig. 5) and the other a young woman of twenty-five (Fig. 6). Although about half of these cases later developed hypochromia there was no clear indication that iron deficiency was responsible for the absence of an increase in mean diameter. The administration of iron at the commencement of treatment in one of the cases (see Fig. 1) led to an increase in mean corpuscular volume but was without effect on the mean diameter or on the form of the Price-Jones curve. It is evident that the factors giving rise to this variety of macrocytic anæmia require further study.

Macrocytic anæmia can arise from *intestinal stenosis*, intestinal anastomoses, &c. (see Meulengracht 1929). Hydrochloric acid is frequently present in the gastric juice, and the presence of Castle's intrinsic factor has sometimes been demonstrated. Rhoads and Miller (1937) have observed that, in animals fed a deficient diet, indol or toxins produced by intestinal obstructions lead to hæmolysis and macrocytic anæmia.

A man aged 50, who had stenosis of the gut following intussusception in childhood, showed typical idiopathic hypochromic anæmia with smooth tongue, spooned nails, and achlorhydria in 1934. He had taken a normal diet and there was no evidence of bleeding. In 1937 the stenosis was short-circuited by entero-anastomosis but periodic attacks of diarrhœa continued. Nine months later the blood picture had changed to that of pernicious anæmia. After a hæmopoietic response to liver extract iron deficiency again became evident in a falling colour-index (Fig. 7).

The Anæmia of Iron Deficiency

The factors which give rise to iron deficiency and hypochromic anæmia are the same in principle as those which give rise to other deficiency states. Iron deficiency arises in children through increased demands of the tissues during rapid growth, inadequate supply of iron from the mother, diets poor in iron, and gastro-intestinal disturbances interfering with absorption. Infants of small birth-weight are especially liable to develop hypochromic anæmia. Infections increase the need for iron and by a vicious circle iron deficiency increases the susceptibility to infections (Mackay 1935). In girls after puberty hypochromic anæmia may develop as a result of the combined demand for iron of growth and menstruation together with diets poor in iron. In idiopathic hypochromic anæmia, which is usually seen in women between the ages of 25 and 50, menorrhagia is extremely common. Other factors giving rise to the anæmia include diets poor in iron, multiple and frequent pregnancies, and gastro-intestinal disturbances associated with achlorhydria. Hypochromic anæmia is common after gastric operations and also in hookworm infection (see Rhoads, Castle, Payne, and Lawson 1934). Blood loss is the factor of primary importance in idiopathic hypochromic anæmia (Heath and Patek 1937) and the syndrome is rare in men. Occasionally,

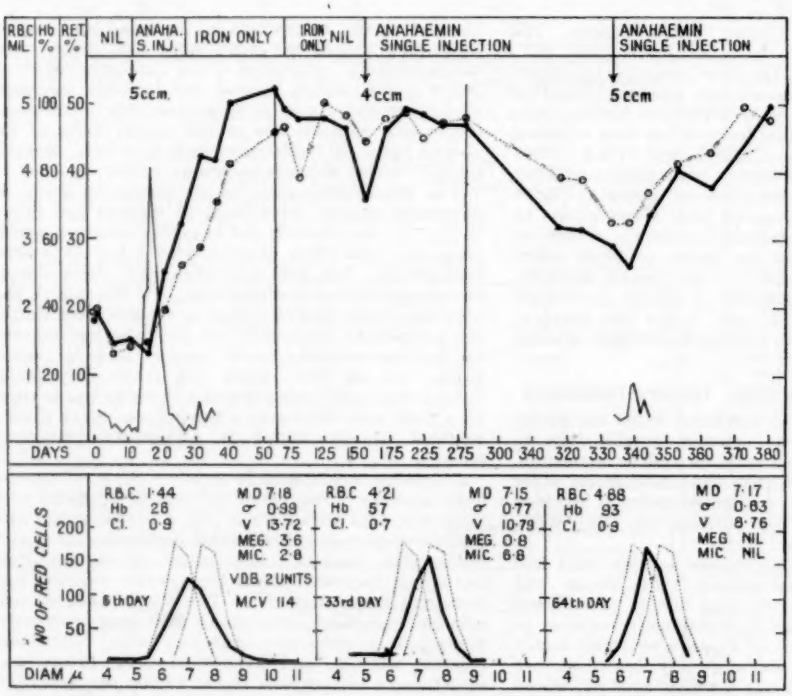


FIG. 6.—Hæmatological findings in a woman of 25 who had formerly suffered from hypochromic anæmia. Menstruation was heavy and the diet was poor. The mean corpuscular volume was raised (114 cubic micra) but the mean diameter was normal. Van den Bergh's indirect reaction 2 units. After a good response to anahæmin the colour-index fell. The administration of iron caused a small secondary reticulocyte peak, the significance of which was difficult to assess, and the colour-index gradually rose almost to unity. The Price-Jones curve became normal. Liver extract is required at infrequent intervals. There has been no return of free hydrochloric acid.

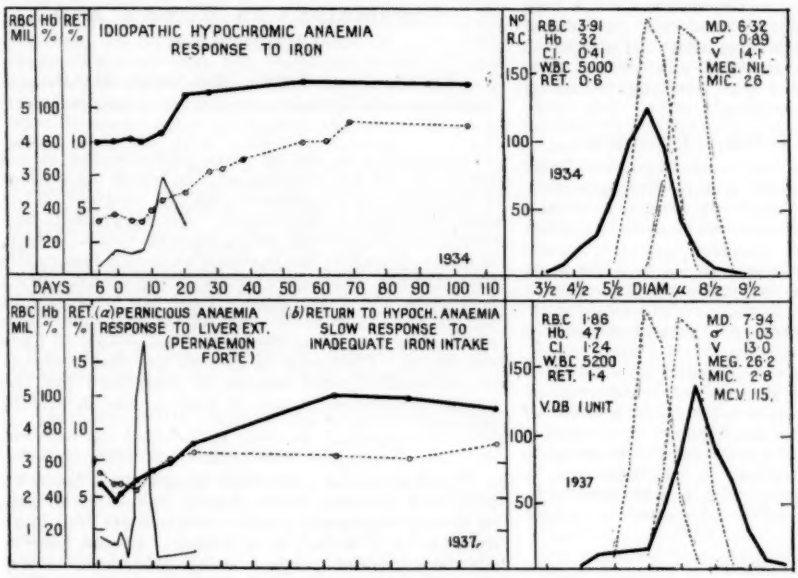


FIG. 7.—Blood findings in a man with intestinal stenosis following intussusception in childhood. A change from idiopathic hypochromic anæmia to pernicious anæmia is illustrated.

however, idiopathic hypochromic anæmia occurs in an adult without any evidence of iron loss, as for example in a miner, aged 45, who gave no history of bleeding, and whose stools were free from occult blood. There was histamine-refractory achlorhydria, and the diet contained no meat, green vegetables, or fruit. A man with intestinal stenosis showed the typical picture of idiopathic hypochromic anæmia in the absence of any history of bleeding or dietary deficiency (Fig. 7). About 80 per cent. of cases of idiopathic hypochromic anæmia with or without dysphagia have a complete histamine-refractory achlorhydria. There are cases intermediate between idiopathic hypochromic anæmia and pernicious anæmia, and cases which change from one to the other. Examples have already been described (see also Fig. 8). Barer and Fowler (1937) observe that achlorhydria decreases the retention of iron from a normal dietary intake of iron, but does not influence the retention when large amounts of medicinal iron are administered by mouth. The addition of hypochromic acid does not increase the retention of iron with either a high or normal intake of iron. Small amounts of iron given by mouth, although retained by the body, may have little effect on hæmoglobin regeneration, whereas larger quantities bring about rapid regeneration (see Fowler and Barer 1937, Brock and Hunter 1937). The explanation of this need for large doses is not known; it does not apply to iron given parenterally which, although liable to cause toxic symptoms in adequate dosage, can be utilised quantitatively in the production of hæmoglobin (Heath, Strauss, and Castle 1932).

The utilisation of small amounts of iron by mouth is sometimes increased by the simultaneous administration of chlorophyll, bile pigments (Patek and Minot 1934), and Whipple's secondary anæmia fraction of liver. Copper is sometimes of value in increasing the utilisation of iron in infants. Large amounts of marmite, dried yeast, and wheat-germ have no effect on hæmoglobin regeneration when given alone in idiopathic hypochromic anæmia (Ungley 1933), and no convincing evidence has been put forward that such vitamin B-containing substances will increase the utilisation of iron. Provided sufficient doses of iron are given there is rarely need for any of these supplements.

Some patients announce that they are quite unable to take iron in any form, alleging that it gives rise to gastric or other disturbances. A woman of 44 had for eleven years defied efforts to induce her to take iron. By first giving a simple syrup and then adding to it gradually increasing doses of iron without her knowledge it was possible to bring about complete

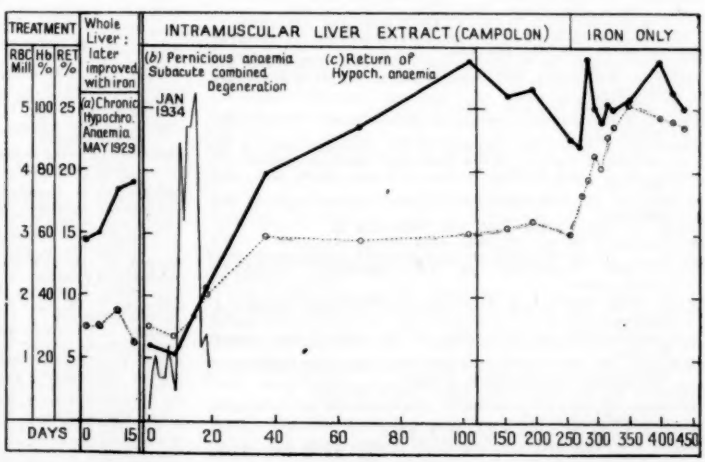


FIG. 8.—Blood findings in a woman showing a change from chronic hypochromic anæmia to pernicious anæmia, and a return to hypochromic anæmia after treatment with liver extract. This case is exceptional in that it was subsequently possible to discontinue both liver extract and iron. She has now been without liver extract for 3½ years, and has not had iron for 1½ years, but nevertheless remains in excellent health with normal blood findings.

recovery without the gastric symptoms which had caused trouble on former occasions. A second patient, a hospital nurse, immediately recognised the addition of iron to a medicinal mixture, but later failed to realise that she was receiving increasing quantities mixed with marmite.

Myxœdema.—Vitamin-C Deficiency

The anæmia of *myxœdema* is sometimes the direct result of lack of thyroxine and is then gradually relieved as the basal metabolic rate returns to normal under the influence of thyroid treatment. In other instances, however, the anæmia appears to be secondary to the achlorhydria which is a frequent finding in myxœdema. In such cases the anæmia may be either hypochromic and require iron, or more rarely it may be pernicious in type and respond to liver therapy.

Deficiency of vitamin C.—Anæmia is a frequent finding in infantile scurvy. About 70 per cent. of cases of adult scurvy show anæmia of greater or lesser degree. A reticulocyte response to vitamin C has been recorded by some workers. In three cases of bachelor scurvy observed by me there was a spontaneous reticulocytosis, and I was unable to demonstrate the specific effect of ascorbic acid (see Fig. 6 in Lect. I).

Conclusion

The anæmias of deficient nutrition, like the avitaminoses, are the result of the variable participation of a number of factors affecting the intake, absorption, and utilisation of essential food factors. Treatment consists in supplying the missing substances in amounts sufficient for the needs of the individual. Reference to the neurological manifestations of anæmia will be made in Lect. III.

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GONORRHŒA IN WOMEN AND CHILDREN *

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GONORRHŒA is one of three diseases—the others being syphilis and tuberculosis—in which the patient is more apt to be pleased with the progress of her condition than is the doctor. My experience, now extending over twenty years, confirms that of others, however, in leading me to regard as unduly pessimistic the attitude that gonorrhœa is incurable. This pessimism has arisen mainly from the chronicity of the disease and from the need for medical supervision and testing long after the patient has ceased to have symptoms. I propose to discuss not the academic or the public health aspects of gonorrhœa but the disease as one sees it now in hospital and in private practice.

SIGNS AND SYMPTOMS IN ADULTS

The diagnosis of gonorrhœa is nowadays made by films and cultures, both urethral and cervical, and by blood complement-fixation tests in cases with more than ten days' history of discharge. At *some* time in the treatment of every case of gonorrhœa careful rectal examination and tests are required. Surprisingly large numbers of patients with no rectal symptoms are found to be carriers of gonococcus in the lower rectum.

Cases with bowel symptoms should always be investigated at the first visit. I have now seen several cases of subacute gonoccocal proctitis, previously treated elsewhere as cases of colitis. Symptoms are much alike—constipation alternating with diarrhœa, abdominal pains—sometimes acute attacks along the whole area of the colon, and discharge of muco-pus or of pure pus and blood per rectum. On examination definite proctitis is found, with muco-purulent discharge. Films and cultures

*Abridged from a communication to the London Association of the Medical Women's Federation on March 22nd, which will appear in full in the *Quarterly Review* of the Federation.

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show gonococci in large numbers. In some of these cases there is severe pain on defæcation also. It is, however, improbable that in a case of gonorrhœa under treatment such symptoms would not at once suggest a rectal extension. The cases more likely to be missed are the cases of rectal infection (no doubt from discharge dropping back in the course of treatment), which are often quite symptomless.

In gonorrhœa of acute or subacute type the urethra is infected in almost 80 per cent. of all adult women, and is usually reddened. Though on careful suburethral massage, along the last inch of the vagina, pus or gleet, sometimes blood and pus, can be expressed from Skenes's ducts, many patients with urethritis make little or no complaint of pain. Urethræ may be infected when there is no outward sign of inflammation.

Vulvitis may lead to burning sensations, tenderness, and pruritus, and if neglected vulval warts may develop.

A common vulvar complication is a *Bartholin abscess* on one or both sides, due to infection of cystic swelling, and this area must always be palpated carefully to exclude infection. If an abscess is present only free incision under a general anæsthetic is of real value. Otherwise one sees cases giving the patient no pain or discomfort but having a residual sinus, from which a drop of pus is easily expressible. This pus shows numbers of gonococci, and is therefore a chronic focus of infectivity.

The severity of gonorrhœa varies from extremely mild symptoms, inconveniencing the patient so little that she may not seek advice till her consort accuses her of infecting him, to the patient who is toxic with the infection from the very start and most acutely ill.

Cervicitis is usually seen where there has been complete coitus: and the typical gonococcal cervicitis consists of an erosion tending to bleed, and with thick tenacious muco-pus attached. The vagina is said to be infected only as a secondary infection, showing *vaginitis*—i.e., granular or warty. But King and Mascall (1935) of the Whitechapel clinic have demonstrated the presence of gonococci in the vaginal fornices, where there were no symptoms of vaginitis.

Local extensions may be to the bladder, causing acute cystitis: and the symptoms vary, depending on the acuteness of the infection, from painful frequent micturition to agonising tenesmus, in which only a drop or two of blood-stained urine is expressed after each painful effort. Extension to the *endometrium* and to the *tubes* is far from uncommon. Where the endometrium is involved the amount of muco-purulent discharge is usually greatly increased. Classically, also, there is menorrhagia, but this is by no means always met with. Extension to endometrium and to the tubes takes place most frequently either after a period (or even during a period) or alternatively early in the infection, where exposure to infection has taken place while greatly under the influence of alcohol. The virulence of some of these cases has to be seen to be believed.

A considerable number of these cases of salpingitis and even of pyosalpinx resolve with expectant treatment. But where resolution is not complete, as evidenced by repeated attacks of pelvic pain when the patient is about again, or by early and heavy menstrual loss, surgical intervention is, in my opinion, essential.

Extension to the *peritoneum* may occur in a case of acute pyosalpinx; evidence of this is to be found in the adhesions present at operation. It is amazing how few symptoms and how little pyrexia one sees in these cases, after the 24 or 48 hours of acute pain has subsided. In fact, quite often the patient with a huge tubo-ovarian abscess easily palpable, and held down by adhesions, may complain only of perhaps a little pain when the bowel moves; and various patients have tried to explain to me by elaborate painless gymnastic exercises, that I must be wrong to think there is a lump inside.

Warts of the vulva are best treated by excision under a general anæsthetic, with stitches inserted where required. Recovery is complete and there is hardly any post-operative pain if the area involved is dressed with flavine in sterile paraffin. It is important to keep these cases as dry as possible before and after operation; and on that account I prefer the urethral and cervical infection to be cleared up, or nearly finished, before the warts are excised. Occasionally, however, the warts disappear in the course of treatment if kept dry and dusted well with compound Dermatol powder or something similar. I have seen warts disappear during vaccine therapy. Treatment of warts by cautery is never very successful in my experience; usually small ulcers result, and these tend to heal slowly and to be very painful.

A very purulent and frothy type of vaginal discharge is found in cases infected by *trichomonas*. This flagellate organism, as is well known, is sometimes an inhabitant of the rectum; and as with *B. coli*, so with trichomonas, a cervical and vaginal infection may easily follow. I mention this organism because it is usually thought that trichomonas infection exists alone; but King and Mascall (1936) have shown that in 59 per cent. of a series of 300 cases the gonococcus coexisted in this infection. It is of course more difficult to isolate till the severity of the trichomonas infection has been subdued by administration of Devegan, or vaginal Stovarsol (both pentavalent arsenical preparations) or by insufflation with silver picrate powder. After that, in a certain proportion of cases the gonococcus is more easily demonstrable, and treatment can then be instituted. In the remainder the discharge and symptoms are due to trichomonas alone. Trichomonas infection is not uncommon in pregnancy.

Metastatic complications of gonorrhœa known to us all are arthritis, tenosynovitis, and iritis. Much less commonly pleurisy or pericarditis is met with; meningitis is never present save as part of a general gonococcal septicæmia following infection with a virulent strain of gonococcus. Joint involvement is usually a simple though painful arthritis, with effusion of fluid; acute septic gonococcal arthritis, requiring operation, is rare. Tenosynovitis and iritis occur usually in chronic or subacute gonorrhœa where there has been no treatment or quite indifferent treatment, and these lesions are precipitated by strain and stress and chills. The blood complement-fixation test is said always to be positive in these cases.

The possibility of gonorrhœa as an underlying focus should never be forgotten in ordinary medical cases of arthritis. The joints most frequently involved are those of wrists and hands, of knees, ankles, and feet, depending on the type of work done by the patient. For example, those with heavy manual work, like the scrubber and laundry worker, are more likely to have the hands and wrists involved; the woman who stands or walks a great deal, and who is also exposed to damp and cold—i.e., the shop assistant, waitress, and above all that product of our times the canvasser from door to door or the demonstrator of labour-saving household goods—tends to severe

arthritis or tenosynovitis of the lower extremities. The amount of arthritis varies, I believe, with the severity of the climate: it is relatively rare in the Royal Free Hospital clinics. The last group of gonococcal arthritis there were all transferred from the medical wards or out-patients' department; of four of these cases in together, only one had ever had any treatment for gonorrhœa, and from that she had lapsed many years before. At the same time I must admit that the most acute case of multiple gonococcal arthritis that I have ever seen accompanied an acute urethritis and double pyosalpinx following delivery, in a case sent on to us from another hospital after the presence of ophthalmia neonatorum in the baby had led to diagnosis of the mother's condition.

GONORRHŒA IN CHILDREN

Gonorrhœa is in the overwhelming majority of cases due to indirect infection from towels, sheets, and sanitary appliances in use by an infected and careless adult. Direct *vulvo-vaginitis* infection, due to criminal assault, is relatively rare. I have seen a couple of children, aged 10 and 11 years, suffering from gonorrhœa due to direct sexual intercourse, for which they received payment in money and of which they boasted. Such unnatural precocity is fortunately uncommon, and is of course only the product of a degraded home where the mother is indifferent to the point of criminality.

The other direct infection in gonorrhœa of children is *ophthalmia neonatorum*, attributable in 90 per cent. of all cases in England to the gonococcus in the mother's cervix or vagina. I do not propose to deal with this question now, but merely wish to state that the notification numbers of ophthalmia neonatorum are falling but very little: this means, I fear, that a considerable number of cases of gonorrhœa in women are going without treatment; 100–120 cases are being notified every week in England and Wales this year. There is not nearly so much blindness now from ophthalmia neonatorum as there was once in the London area; this is partly owing to the admirable treatment given by St. Margaret's (L.C.C.) Hospital in such cases. But the fact remains that it is not creditable that so many weekly notifications should still occur. No doubt notification is far more complete now than it was in the past, and in that way the incidence may well be less than it appears to be. But the numbers are still far too large.

Gonococcal vulvo-vaginitis in children is, as all know, a great source of worry and also of infection, as the infected and undiagnosed child may rapidly spread infection through a children's ward or a school. Apart from the public health aspect, the problem has been, till recently, a very disheartening one owing to the frequency of relapses. The most modern treatment of such cases consists (in addition to local irrigation, vaginal packs, and vulvar sitz-baths) in administration by mouth or by injection of an œstrin preparation—e.g., Menformon, of which a tablet of 3000 units may be given once or twice daily. Mostly the purulent discharge clears up rapidly, and often negative tests are got much earlier than by older methods of treatment. Critics of this method say that the children suffer from pelvic congestion, which causes an aggravation of the tendency to masturbate.

Dr. Anwyl-Davies has observed gross mammary development following this treatment, but Dr. Kathleen Brown (1935) and Dr. D. Nabarro (1935) have both spoken in its favour, and my own much more limited observation has proved its usefulness. The other medicament to cut short infection is Prontosil album: 1 gramme to 2 grammes, carefully spaced out into four doses, may be given to children over 18 months, with due precaution against poisoning. A problem arises when the child returns home. Has the original focus of infection been cured and are the child's sanitary needs adequately looked to? Most do their very best, but poverty and overcrowding make their best very much less good than medical care requires, and a small proportion of children suffer relapse or reinfection on their return home.

Dr. Brown reports that at the Children's Medical Home, Waddon (a home for girls aged 3–14 years), prontosil album was used in treating twenty cases of gonococcal vulvo-vaginitis from September to November, 1937. The dosage given amounted to a total of 15 to 45 g., eleven cases receiving over 20 g. The immediate clinical response was excellent in all cases but one, and the majority were free from purulent discharge after two or three days. Eighteen cases have had no clinical or pathological relapse over a period of 16 weeks or longer. The remaining two cases were failures. Four cases showed signs of intolerance and the drug is now given in a total dosage of 15 g. for children under 56 lb. and 20 g. for those over 56 lb. in weight. Dr. Brown points out that the great advantage of the sulphanilamide preparations is that local treatment is reduced to a minimum and mostly consists merely of swabbing and painting for ten days.

Tests of cure in children are no less rigorous and stringent than they are in adults. Here again rectal tests are essential, as a considerable proportion of children have infection of the rectum with—or without—symptoms.

As the infected child may suffer from all the complications of the adult gonorrhœa—Bartholin abscess, arthritis, iritis, even, though more rarely, salpingitis—it is easy to see how urgent is good treatment for infected small girls, and how isolation from other children is of paramount importance till they are pronounced cured.

TREATMENT

Local and medicinal.—The essentials for treatment are rest, satisfactory drainage of uterus, local treatment by sitz-baths, douches, and other treatments, and oral medication. The public believe that *the* treatment of gonorrhœa is douching—and douches, self-administered, of one pint of soap and water, or of permanganate, or of some other antiseptic are sometimes given by patients to themselves thrice daily. The result is bleaching of vulva and vagina, a waterlogged condition of the vaginal wall, and continuous desquamation of epithelial cells. The pathological conditions are naturally untouched by this ineffectual meddling.

Ideal treatment consists of a great deal of *rest*, where possible in bed. Where this is out of the question, as it often is, by going to bed early: and by staying in bed when possible—e.g., on Sundays, most of the day. But certainly cycling, walking, swimming, and dancing are completely forbidden. When patients ask what they *can* do, one suggests needlework, learning a new language, taking up a musical instrument of modern type, and so on. If the urethral test is gonococcus positive, a urinary antiseptic is indicated, as is of course the case where there is bladder involvement with frequency and pain. As a rule patients are very comfortable on an alkaline mixture—pot. cit. with sod. bicarb.—

whether there are bladder symptoms or not; and the alkalinised patient seems to improve rather faster. Regular bowel evacuation is of paramount importance; the average hospital patient is badly constipated, and no one who has not tried it can imagine the hopelessness of clearing up a discharge where the rectum is chronically loaded. No treatment will remove the superimposed heavy *B. coli* (proteus) infection save regular bowel action by diet and drugs—or in severe cases by colonic lavage too.

Diet is of great importance. Everyone knows that alcohol, black coffee, and curries (to put it briefly) are forbidden while gonorrhœa is being treated; but on the positive side a good generous diet, including milk, eggs, butter, and plenty of fresh fruits and salads, helps a patient to recover much more quickly. This can be given to the *unmarried* girl in our hostels; but, sadly enough, the innocently infected wife of the poor man has an indifferent diet, short of nourishment and vitamins. The unduly stout woman or girl, on the other hand, recovers slowly from gonorrhœa and is prone to boils, intertrigo, and warts. She must be dieted and her endocrine deficiency, if present, must be dealt with.

Douching and painting.—Local douching is required only for severe purulent discharge or for relief of pain, and should be done by a trained nurse. I do not believe that any woman can douche herself well. We all tend to keep a patient too long on douching, though patients often ask to be put back on it when it has been discontinued. After the massive purulent discharge is gone better treatment consists in cleansing the cervix well with a saturated solution of sod. bicarb. or 10 vol. H_2O_2 and treating it with probes as far into the endocervix as can be reached, with protargol and glycerin 10 per cent., or with glycerin only, or glycerin in combination with boric, or acriflavine, or glycerin Dettol. Unless there is a distinct erosion the cervix should be dried gently and left; in acute inflamed cases a small tampon soaked in glycerin may be placed against the cervix, or a light pack of 1 inch ribbon gauze soaked in a glycerin compound. Save in cases of acute cervicitis the vagina should in my opinion be kept as dry as possible.

Medicines.—Where there is cystitis sometimes the mist. pot. cit. with hyoscyanus or buchu does not give relief. In some of these cases Pyridium tablets, 6 or 8 daily, give comfort; some patients do best on a mandelic acid preparation. I have found Boots' Neoket admirable in some of these cases. Opiates or other sedatives may be required during the first 48 hours of treatment.

The greatest medicinal progress in the treatment of gonorrhœa has resulted from the administration of prontosil album in doses of 3·5–4 g. daily, given with an acid or an alkaline mixture depending on the vaginal *p*H. In the main the results are in the highest degree encouraging, and the clinical and pathological improvement is in some cases dramatic. The burning and itching of acute vulvitis stops at once. This large dosage is continued where tolerated for seven days (the toxic signs and symptoms liable to be caused by this drug are now well known and must be watched for); then for another week or so half the amount is prescribed—the tablets to be spread well over the day, the last tablet to be taken at bedtime. The drug must be stopped forthwith should any very untoward symptoms or signs arise, but this has happened only once or twice in our department.

Vaccines and antitoxin.—When patients are intolerant or cannot be kept under close medical supervision I use in ambulatory cases a vaccine or gonococcus antitoxin. I have found the latter very useful in a number of cases during the past 18 months, but have observed rather more complications following its use than Anwyl Davies seems to have found, varying from intense pain and irritation at the seat of infection after the fourth or fifth dose, to pyrexia associated with inguinal adenitis, and in one case a dramatically severe serum rash—this even though each dose was invariably "guarded" by 4 or 5 minims of adrenaline.

Heat therapy.—The treatment of gonorrhœa and its complications by heat electrically or chemically produced is now an old story. I have found diathermy treatment very useful, particularly in the urethra and rectum. More recently we have been able to relieve the pain of salpingitis, or sometimes pain following salpingectomy, by the use of the Elliott machine. This consists of an applicator of latex attached by two rubber tubes to a small machine with electrically heated water: the temperature of water is shown by a thermometer, and the extent of the pressure by a regulating instrument to the left. This machine brings much comfort to most patients. The temperature of water in the latex bag is usually about 116° F. at the beginning. The patient lies with the applicator in the vagina and the temperature is allowed to rise to 128° F. The treatment lasts for an hour at a time, and the relief from pain is so great that some of our patients fall asleep on the couch during the treatment. Twelve to twenty-four treatments are given, daily; pain is relieved and the menstrual loss and rhythm becomes normal, or nearly so. Final treatments, which I must mention very briefly, are by artificial pyrotherapy. In the past I have often been forced to use protein shock treatment to start resolution of a chronic resistant case of gonorrhœa. As the results of sulphanilamide are now found to be as good in chronic and in subacute gonorrhœa as in the acute condition, protein shock treatment may soon become outmoded.

Since it is held that for resistant types of gonococcus a temperature lower than 105°–106° F. is useless, the "Kettering Hypertherm" has been used in America for some time. The patient is wholly (save for the head) introduced into a machine which electrically produces the required temperature. The patient is under continuous medical and nursing supervision during the whole treatment, which lasts for 5 hours at 105°–106° F. Several hours are spent slowly rising to this temperature and falling to normal again, so the process lasts 12 hours. This machine is not in general use in England, though I believe that St. Bartholomew's Hospital have a machine, and I know of one private electrotherapist who uses one. A film demonstrating the results of the use of the Kettering Hypertherm, in advanced cases of syphilis and in gonococcal arthritis, is impressive.

TEST OF CURE

Finally, one may ask "and what is the test of cure?"

The minimal satisfactory tests consist in negative films and negative cultures taken just as three menstrual periods end, the last at least after a month without treatment. The last tests must be taken after a provocative painting, or best of all after a heavy dose of alcohol the night before the tests. In addition the blood complement-fixation test should be negative and the patient's clinical condition must be free from all signs and symptoms of infection.

The use of cultures is essential. At our own V.D. pathological laboratory at the Royal Free during 1937, in 517 cases films and cultures were both positive; in 31 cases films were positive, cultures negative; while in 323 cases where films showed *no* gonococci cultures grew the gonococcus beyond a doubt. This indicates, I think, that though in many cases the best person to treat the patient suffering from gonorrhœa is her general practitioner, because in this way she retains contact with her best medical friend and does not feel the horror which sometimes overwhelms the sensitive patient attending hospital, he must use not his impressions but the most rigorous laboratory tests as tests of cure. If these are not persevered with till they are completely satisfactory, no more will have been done than to add to the number of cases of chronic gonorrhœa, and the unmarried girl who finally marries may find later, to her cost and sorrow, in the words of Mr. Johnston Abrahams, that "the most sensitive media for test of cure are the urethra of the husband and the eye of the child."

OBSERVATIONS ON THE CELLULAR BASIS OF THE GORDON TEST FOR LYMPHADENOMA

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The discovery that an encephalitogenic agent was present in the lymph nodes from cases of lymphadenoma was first made by Gordon (1932). He showed that suspensions of such material after intracerebral inoculation into rabbits produced a peculiar condition of paralysis and ataxia, which resembled that due to the encephalitis of known virus diseases. It appeared that this encephalitogenic power was a specific property of lymphadenomatous glands and could be used as a diagnostic test in the disease. Several observers have employed it successfully in this manner (Gordon 1933, Van Rooyen 1934, Chapman 1936, Goldstein 1936, Rosenberg and Block 1936, and others).

When Friedemann and Elkeles (1933) found that a similar effect on rabbits could be produced by injecting suspensions of human marrow and spleen, this naturally threw doubt on any theory that the encephalitogenic agent was a virus. Although this belief appears to be no longer held, yet the nature of the agent has not been decided and its relationship to lymphadenoma remains mysterious. It is usually regarded as a chemical toxin or enzyme and appears to be confined to certain cells, from which it is liberated by autolysis. The experiments that will be described in this paper were carried out to discover which type of cell contained the agent. Human cells have been used and also the tissues from certain animals not previously tested. At the same time histological examinations have been made of the brains of the experimental animals and the histological changes induced have proved a reliable test for the agent.

DISTRIBUTION OF THE AGENT IN HUMAN TISSUES

Examination of normal tissues by Friedemann (1934) and Kelser and King (1936) for the presence of an encephalitogenic agent showed that positive findings were only obtained with bone-marrow and spleen or with leucocytes. This suggests that the agent is associated either with one type of leucocyte only, or perhaps with more than one type and also with the immature forms and allied cells which are to be found in the spleen and bone-marrow. In leukæmia, samples of blood may contain some form of mature or immature leucocyte in a predominating proportion and examination of these has enabled me to obtain information regarding the presence of the agent in leucocytes. In these experiments leucocytes were separated by differential centrifugalisation from citrated blood obtained under sterile conditions. After washing in saline 0·35 c.cm. of the leucocytic cream has been inoculated intracerebrally into rabbits.

The results of these experiments are summarised in the Table. It was found that the agent could be demonstrated in the mixtures of mature granular cells and myelocytes obtained from cases of myelocytic leukæmia, but not in suspensions composed chiefly of myeloblasts. The one case of eosinophilia examined gave a strongly positive result. Weak positive results have also been obtained with lymphocytes; this is surprising since suspensions of lymph nodes in lymphatic leukæmia always give a negative biological test (Gordon 1933). On two occasions I have inoculated rabbits with thick suspensions of the lymphocytes from lymph nodes in this disease, with negative results. The suspensions have been obtained by mincing and grinding up the glands finely with a minimum amount of saline. The suspension was filtered through muslin and centrifuged. The deposit was inoculated after heating to 60° C. to kill any possible contaminating organisms. The latter procedure, which is known not to destroy the agent (Gordon 1934, Friedemann 1934), has been used as a routine when dealing with post-mortem and possibly contaminated material.

The finding in the bronchi of an asthmatic patient at autopsy of thick mucoid material full of eosinophils, has enabled me to test an almost pure suspension of this type of leucocyte. The rabbit inoculated with a suspension of the material in saline developed the typical paralytic condition, commencing on the second day after inoculation.

The presence of the agent has also been confirmed in pure suspensions of neutrophil leucocytes. For this purpose two samples of pus have been diluted and sterilised by heating to 60° C. for an hour. The first was from a streptococcal abscess and it proved to be active for a rabbit in a 1 in 4 dilution. The second, from a staphylococcal abscess, was active in a 1 in 2 dilution.

As the experimental evidence suggests that the agent is particularly associated with mature neutrophil and eosinophil granular leucocytes, it would be expected that it would be found in lymph nodes in which there has been infiltration by these cells. Biological tests have therefore been done on suspensions made from the lymph nodes of a case of chronic myelocytic leukæmia, removed at autopsy, and from one of myelosclerosis. In the latter there was myeloid metaplasia in the abdominal glands. Both these tests were positive. Paterni and Maroncelli (1935) have previously obtained a positive biological test in a case of chronic myelocytic leukæmia.

FINDING OF THE AGENT IN ANIMAL TISSUES

It has been believed that encephalitogenic power was a property only of certain tissues of man and

monkeys. The bone-marrow of many other animals has been tested and in every case has given negative results (Friedemann 1934, Gordon 1934, Kelser and King 1936). It appears, however, that the tissues of rats and mice and of chickens have not been examined, although these are the animals commonly used for experimental research into blood diseases. I have found that the intracerebral inoculation of suspensions of chicken marrow and spleen has in every case caused a paralysis that appears identical with that produced by human material. The encephalitogenic agent has similarly been demonstrated in mice by using suspensions in saline made from the spleens of several animals. Repeated experiments were carried out with the spleens of rats, but no encephalitic action was obtained. Tests of guinea-pig and rabbit marrow were also negative.

The next step was to test both human and chicken marrow for encephalitogenic power on chickens. Three chickens were inoculated intracerebrally with splenic suspensions resembled those of normal mice and produced paralysis.

HISTOLOGICAL CHANGES PRODUCED BY THE AGENT

During the course of the experiments described above and of others carried out in order to investigate the nature of the agent, a large number of animal brains have become available for histological study. The material has consisted of the brains of rabbits and guinea-pigs and of a few chickens. The majority have been obtained from animals exhibiting, during life, the paralysis typically produced by the agent. The remainder came from unaffected animals or those who only showed atypical signs; these were used as controls. As a routine the brains have been fixed in formalin and longitudinal sections cut through the brain; these have been stained with hæmatoxylin and eosin and with toluidine-blue for the demonstration of Nissl granules. The source of the agent responsible for the paralysis of the animals has

SUMMARY OF RESULTS WITH LEUCOCYTIC SUSPENSIONS

Disease.		Neutrophils %.	Eosinophils %.	Basophils %.	Myelocytes %.	Myeloblasts %.	Lymphocytes %.	Monocytes %.	*Biological test.*
Normal ..	A	Pooled samples of blood from several patients.							Negative.
	B								"
	C								Strongly positive.
Chronic myelocytic leukæmia.	A	51	1	9	34	2	3	..	Doubtful weak positive.
	B	25	5	..	65	3	2	..	Positive.
	C	44	2	..	42	8	4	..	"
Acute myelocytic leukæmia.	A	3	..	..	2	87	7	1	Two rabbits negative.
	B	..	..	..	..	Nearly 100	..	..	Two samples tested. Both negative.
Acute lymphatic leukæmia ..		1	..	..	..	..	99*	..	Positive.
Chronic lymphatic leukæmia.	A	2	..	..	..	..	98	..	Weak positive. Signs increased by a 2nd inoculation with lymphocytes.
	B	1	..	..	..	..	99	..	Negative, but signs increased in previously mentioned animal.
	C	10	..	..	..	..	90	..	Negative.
	D	1	..	..	..	..	99	..	1st rabbit: doubtful weak positive. 2nd: negative. 3rd: weak positive.
Eosinophilia ..		5	85	..	..	..	10	..	Strongly positive.

* 72 per cent. lymphoblasts.

human marrow. They all developed signs resembling those produced in rabbits by the agent. Spastic paralysis, ataxia, neck rigidity, spasms, and salivation were noted. On the other hand, two chickens inoculated similarly with chicken marrow were unaffected. This contrast in effect is probably due to an essential difference between the human and chicken agents; it did not appear to be due to any ability of the chicken's brain to neutralise the agent in chicken marrow. An active suspension of the latter, after incubation with an emulsion of chicken brain at 37° C. for eighteen hours, showed no reduction in encephalitogenic power, when compared with suspensions that had been incubated similarly with an emulsion of rabbit brain and with saline.

It has also been possible to examine the tissues of mice affected by a transmissible form of myelomatosis. The mice had been inoculated subcutaneously with tumour cells obtained from an already affected animal; local infiltrating tumours developed associated occasionally with myeloid leukæmic changes in the blood. Kaaleund-Jørgensen (1936) regards the cells of the tumour as myeloblasts and the condition as a transmissible mouse myeloid leukæmia. Thick suspensions of tumour cells have failed to affect rabbits after intracerebral inoculation; varied; brains of rabbits inoculated with lymphadenomatous gland suspensions, human and chicken marrow, and human leucocytes have been examined. In the case of guinea-pigs the source of the agent has been both suspensions of lymphadenomatous glands and of human marrow. Inoculation with human marrow produced the paralysis in the chickens examined.

Examination of this material has shown that there is quite a well-marked variation in the microscopical appearances of the brains, but that these differences are in no way related to the origin of the agent. A suspension of lymphadenomatous glands has, for instance, the same histological effect as human marrow or leucocytes. The one constant and conspicuous change is degeneration of the Purkinjé cells; it has been found in all the brains of affected guinea-pigs and chickens as well as in all the rabbits. The earliest change appears to be a swelling of the cytoplasm with disappearance of the Nissl granules, the nucleus remaining unchanged. Later the appearances indicate death of the cell; the nucleus is found to be pyknotic or the nuclear chromatin broken up into darkly staining masses with disappearance of the nuclear membrane. The whole cell is shrunken and distorted and the cytoplasm shows a homogeneous dark purple colour. The damaged cells finally disappear leaving spaces, which are clearly

recognisable in material obtained from animals dying soon after inoculation. When the animal is killed later only the marked diminution of Purkinjé cells is apparent. No increase in microglia has been observed around the degenerating cells. These changes are patchy and groups of normal cells or those only moderately affected are usually found. This characteristic degeneration of the Purkinjé cells has been absent from the brains of all animals not showing the typical paralysis.

A similar cellular degeneration and destruction has been found in the cornu ammonis of two rabbits' brains and cells showing the typical degeneration have frequently been found in the mid-brain. A widespread Nissl degeneration of nerve-cells is usually present, but this change is variable in degree. The cerebral cortex is not much affected. Many cells appear dark and shrunken, but similar cells are as frequently seen in the control material. In some of the brains there was no obvious increase in the microglia, but in others these cells were present in large numbers. Collections of mononuclear cells round the vessels were observed in a few sections; although these were greatest near the site of inoculation, they were occasionally present as far away as the cerebellum. In addition, there is constantly a lymphocytic meningitis. If the inoculum has consisted of a cellular suspension, it may often be found collected in the ventricles or on the surface of the brain, and there is well-marked proliferation of the capillaries in the neighbourhood. The whole brain usually appeared œdematous and the capillaries increased in number and dilated.

The occipital cortex of the guinea-pigs was examined carefully for evidence of any cell damage to account for the blindness noted in these animals. None was found and the retinæ of the eyes also appeared normal on section. The brains of the chickens inoculated with human marrow showed the characteristic changes in the cerebellum; it was less marked than in the rabbit material, but was associated with a marked Nissl degeneration of the rest of the nerve-cells. Sections of the brain of one rabbit were stained by the Weigert-Pal technique; this did not demonstrate any demyelination. The long Mann method was used for staining brains of other rabbits and a search was made for inclusion bodies, but without success.

Kelser and King (1936) described similar histological changes in the material they examined; they used human and monkey marrow as the source of the agent. Their findings have thus been confirmed and extended to include other sources of the agent.

DISCUSSION

These experiments show that the encephalitogenic agent is present in neutrophil and eosinophil leucocytes and in the mixtures of these with myelocytes. It appears also to be present to some extent in the circulating lymphocytes, but the encephalitogenic action of normal leucocytic suspensions and of marrow is probably due to their content of mature granular leucocytes. The agent has not been found in such primitive cells as myeloblasts.

It has already been stated that no histological differences have been found depending on the various sources of the agent. Likewise the condition of the affected animals during life is the same. The agent in lymphadenomatous glands therefore has the same effect as that in leucocytes and there is no reason to think they are not identical. It is likely that the activity of a gland suspension depends on its cell content. In such diseases as myelocytic leukæmia and myelosclerosis, in which there is infiltration of the lymph nodes with myeloid cells, these nodes give a positive test. In lymphadenoma granular cells are usually found in the lymph nodes, the eosinophils being the most conspicuous. Turner, Jackson, and Parker (1938) consider that the eosinophil leucocytes alone contain the agent. But the experiments described in this paper suggest that the neutrophil leucocyte is equally active, and that the lymphocyte of the blood is slightly active. Van Rooyen (1937) has found that the activity of a lymphadenomatous gland is not proportional to its eosinophil content; he considers, however, that it may be dependent on the number of reticulum cells. If, then, it is true that the biological test in lymphadenoma depends on the cell content of the lymph nodes, its limitations are obvious when used as a diagnostic measure in a case of lymphadenopathy.

When a biological test is carried out, the specificity of the degeneration found histologically makes it possible to confirm the result of the test. This histological examination also affords a more delicate method of detecting the agent. When a series of dilutions of an active suspension has been inoculated into guinea-pigs, the high dilutions have produced degeneration of the Purkinje cells, although during life the animals did not appear to be affected. Parallel experiments have also shown that guinea-pigs are more sensitive than rabbits. In the guinea-pigs an early sign is defect of vision and this may be present in the absence of paralysis or ataxia.

SUMMARY

1. An encephalitogenic agent has been demonstrated in suspensions of eosinophil and neutrophil leucocytes, mixture of these with myelocytes, and in the circulating lymphocytes. It was absent from myeloblasts. It was present in lymph nodes in which there had been infiltration with myeloid cells.

2. A similar agent has been found in chicken and mouse spleen, but not in that of rats. It was absent in a mouse tumour composed of myeloblasts.

3. Distinctive histological changes result from the intracerebral inoculation of the agent into animals. These are described.

I wish to thank Dr. M. H. Gordon and Prof. J. McIntosh for the valuable help they have given me; the former has, in addition, kindly placed material at my disposal, and the latter has allowed me to carry out the greater part of these experiments in the research laboratories at the Bland-Sutton Institute of Pathology, Middlesex Hospital. I have been enabled to carry out this work with the aid of the Lawrence research scholarship at St. Bartholomew's Hospital.

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LONDON SCHOOL OF DERMATOLOGY.—A course of lectures will be given at St. John's Hospital for Diseases of the Skin, Lisle-street, W.C., from May 2nd to May 27th, at 5 P.M. Instruction will also be given daily in the out-patient department at 2 P.M. and 6 P.M. on weekdays and at 10 A.M. on Saturdays. Further information may be had from the dean of the school, Lisle-street, London, W.C.2.

THE EFFECT OF NICOTINIC ACID ON PELLAGRINS MAINTAINED ON A PELLAGRA-PRODUCING DIET*

BY JEAN M. GRANT
ELISABETH ZSCHIESCHE
AND
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Spies, Cooper, and Blankenhorn (1937) reported that the mucous membrane lesions of pellagra heal promptly on the administration of nicotinic acid, and from these results concluded that nicotinic acid is an antipellagric factor. Fouts, Helmer, Lepkovsky, and Jukes (1937) have described improvement in the mucous membrane lesions of pellagrins who were given nicotinic acid in addition to a pellagra-producing diet (the diet was the same as that used by Spies, Cooper, and Blankenhorn in their studies). Smith, Ruffin, and Smith (1937) described improvement in a case taking a similar pellagra-producing diet within twelve days of the administration of nicotinic acid. Spies, Cooper, and Blankenhorn (1938) more recently have confirmed their previous observations in a series of twelve cases, and in addition have shown that the mucous membrane lesions of pellagra heal on the administration of nicotinic acid whether or not the patient receives food. The present report is concerned with an evaluation of the effect of nicotinic acid when used as a supplement to a pellagra-producing diet.

MATERIAL AND METHODS

Seven persons with characteristic pellagrous lesions were selected for study. All of them had extensive mucous membrane lesions, six exhibited characteristic dermal changes, four had mental symptoms, and four had peripheral neuritis. Spies has previously shown (1932, 1934, 1935) that a substance can be tested for the presence of an antipellagric factor by administering it to pellagrins subsisting on a pellagra-producing diet. Briefly, this method consists in selecting severely ill pellagrins with classical mucous membrane lesions, isolating them, and restricting them to a pellagra-producing diet. The diet used is shown in the accompanying Table. If no healing of the mucous membrane lesions occurs after the patient has remained on the diet for two or three days, the substance to be tested is administered. If, after the administration of the substance, the mucous membrane lesions promptly disappear and the patient's sense of well-being improves, one can conclude that the substance is potent and that it has been given in adequate amounts.

The present studies were carried out in the following manner: All patients were restricted to the basic pellagra-producing diet. If, after 48–72 hours there was no improvement in the oral mucous membrane lesions, the patients were given daily supplements of nicotinic acid until improvement took place. These supplements varied in amount and totalled from 200 to 1500 mg. per day. The nicotinic acid was usually given in divided doses of 100–200 mg. each. After nicotinic acid had produced healing of the mucous membrane lesions in all cases, this supplement was discontinued in two of the cases, while the remaining five continued to take daily supplements of this substance. The seven patients went on taking the basic diet for 1–2 months from the time the test began, irrespective of whether or not the supplements of nicotinic acid were continued. At the end of the study they were all given well-balanced diets and were discharged to their homes greatly improved. The urine of the seven pellagrins was repeatedly tested for porphyrinuria by the method of Beckh, Ellinger, and Spies (1937). Special studies of some of the patients with peripheral neuritis were made. Summaries of the two cases in which nicotinic acid was discontinued while the patient remained on a restricted diet follow.

CASE 1.—This patient, a negro female, aged 16, had classical symptoms of pellagra. Her diet had been deficient for a number of years. She had not indulged in alcoholic beverages and had no predisposing disease. When first seen, the mucous membrane lesions of her mouth, tongue, and vagina were fiery red. Many large, aphthous ulcers and thick membranes from Vincent's organisms were observed. She also had pellagrous dermatitis and increased porphyrinuria. She was given a pellagra-producing diet at the time of admission. During the next two days the mucous membrane lesions became worse. She was then given 100 mg. of nicotinic acid each hour for five hours. Twelve hours later she was given an additional 500 mg. in a similar manner. Within forty-eight hours the mucous membrane lesions had healed and the increased porphyrinuria had disappeared. The dermatitis began to heal soon after the patient entered the hospital and continued to heal throughout the course of the study. Desquamation was almost complete at the end of the first two weeks. The nicotinic acid was discontinued and the patient remained on the pellagra-producing diet. Within fourteen days there was a mild recurrence of the mucous membrane lesions and increased porphyrinuria but no return of the dermatitis. Again the administration of nicotinic acid was followed promptly by healing of all mucous membrane lesions and disappearance of the porphyrinuria. As soon as the mucous membrane lesions had healed she was given a 4500-calorie, well-balanced diet, and two weeks later was discharged from the hospital free from symptoms.

CASE 2.—This patient likewise had developed characteristic pellagra, severe Vincent's infection, and increased porphyrinuria following the ingestion of an inadequate diet. Upon admission to the hospital she was put on a pellagra-producing diet and the mucous membrane lesions became worse. Two days later she was given five doses, 200 mg. each, of nicotinic acid. The mucous membrane lesions and increased porphyrinuria disappeared within forty-eight hours of the initial administration of nicotinic acid. The patient remained on a pellagra-producing diet and was allowed physical exercise, but was not given nicotinic acid. Within ten days the mucous membrane lesions and increased porphyrinuria recurred. They increased in severity and five days later nicotinic acid was administered as before. Again the lesions and increased porphyrinuria disappeared without any change being made in the diet. Once more the nicotinic acid was discontinued. Three weeks later the lesions and increased porphyrinuria recurred, and again on the administration of nicotinic acid they disappeared promptly. The skin lesions, as in Case 1, began to heal soon after the patient entered the hospital and continued to heal throughout the course of the study. Despite the fact that the patient was free from any symptoms she was given a 4500-calorie, well-balanced diet for ten days before discharge from the hospital.

OBSERVATIONS

The mucous membrane lesions of the seven patients taking a pellagra-producing diet improved within

* These studies were conducted in the medical wards of the Cincinnati General Hospital and the expenses were defrayed by a grant from the Rockefeller Foundation.

forty-eight hours of the administration of nicotinic acid. This improvement could usually be detected within twenty-four hours, and oftentimes within twelve hours. The ptyalism, Vincent's infection, and increased porphyrinuria likewise disappeared. The peripheral neuritis did not improve during the time nicotinic acid was given to these patients; this will be discussed in a subsequent publication. The appetite of five patients improved, and all of them lost their sense of apprehension and had an improved sense of well-being.

These observations show that nicotinic acid is an important supplement to the pellagra-producing diet. The prompt improvement of the mucous membrane lesions under the conditions of this study indicates that nicotinic acid should be considered a specific antipellagric factor. In addition to being specific for these symptoms of pellagra, this substance promotes a sense of strength and a feeling of well-being in the majority of patients taking the pellagra-producing diet. The observation that the increased porphyrinuria of pellagrins restricted to a pellagra-

BASAL DIET

Food.	Weight (g.).	Protein (g.).	Fat (g.).	Carbohydrate (g.).	Minerals (g.).								Vitamins A, B_1, C, D = international units. Vitamin G = Sherman-Bourquin units.				
					Ca.	Mg.	K.	Na.	P.	Cl.	S.	Fe.	A	B_1	C	D	G
BREAKFAST.																	
Homing grits ..	35	3·3	0·1	27·5	0·004	0·020	0·061	0·007	0·051	0·016	0·048	0·0003	..	..	..	..	Trace
Cornmeal muffins* (3 muffins) ..	..	9·9	11·1	91·2	0·019	0·048	0·161	0·051	0·138	0·108	0·148	0·0009	192–321	24	..	..	15
Sugar	15	..	..	15·0	..	..	..	..	..	..	..	..	..	..	..	..	..
Coffee	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
DINNER.																	
Fried cornmeal mush:†																	
Cornmeal, dry weight ..	20	1·6	0·2	15·9	0·004	0·017	0·043	0·008	0·038	0·029	0·022	0·0002	84–140	5	..	..	6
Pork fat ..	40	..	40·0	..	..	..	..	..	..	..	..	..	3	22	..	..	..
Cane-sugar syrup:‡																	
Sugar	14	..	..	14·0	..	..	..	..	..	..	..	..	..	..	..	..	..
Water	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Sweet potato ..	163	2·9	1·4	44·6	0·031	0·046	0·647	0·063	0·073	0·153	0·039	0·0012	11,410	24	240–360	..	57
Cabbage, raw shredded ..	16	0·2	..	0·8	0·007	0·002	0·039	0·004	0·005	0·007	0·010	0·0001	..	3	88–132	..	6
Cornmeal muffins (3 muffins) ..	..	9·9	11·1	91·2	0·019	0·048	0·161	0·051	0·138	0·108	0·148	0·0009	192–321	24	..	..	15
Sugar	10	..	..	10·0	..	..	..	..	..	..	..	..	..	..	..	..	..
Coffee	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
SUPPER.																	
Fried cornmeal mush:																	
Cornmeal, dry weight ..	20	1·6	0·2	15·9	0·004	0·017	0·043	0·008	0·038	0·029	0·022	0·0002	84–140	5	..	..	6
Pork fat ..	40	..	40·0	..	..	..	..	..	..	..	..	..	3	22	..	..	..
Cane-sugar syrup:																	
Sugar	14	..	..	14·0	..	..	..	..	..	..	..	..	..	..	..	..	..
Water	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Spinach	60	1·2	0·1	1·9	0·040	0·022	0·046	0·075	0·041	0·044	0·023	0·0015	21,000	7	480–720	..	75
Cornmeal muffins (3 muffins) ..	..	9·9	11·1	91·2	0·019	0·048	0·161	0·051	0·138	0·108	0·148	0·0009	192–321	24	..	..	15
Sugar	15	..	..	15·0	..	..	..	..	..	..	..	..	..	..	..	..	..
Coffee	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	..	40·5	115·3	448·2	0·147	0·268	1·362	0·318	0·660	0·602	0·608	0·0062	33,160–33,659	160	808–1212	..	195

Calories from protein	162·0
" " fat	1037·7
" " carbohydrate	1792·8
Total calories	2992·5

Note.—Protein, fat, carbohydrate, and minera values—Sherman, H. C.: Chemistry of Food and Nutrition.
Vitamin values—Sherman, H. C.: Chemistry of Food and Nutrition.
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* RECIPE FOR CORNMEAL MUFFINS

Materials.	Weight (g.).	Protein (g.).	Fat (g.).	Carbohydrate (g.).	Minerals (g.).								Vitamins A, B_1, C, D = international units. Vitamin G = Sherman-Bourquin units.				
					Ca.	Mg.	K.	Na.	P.	Cl.	S.	Fe.	A	B_1	C	D	G
Cornmeal ..	138	11·4	1·7	109·7	0·0248	0·1159	0·2939	0·0538	0·2622	0·2014	0·1531	0·0012	579–966	34	..	..	45
White flour ..	165	18·8	1·6	123·9	0·0330	0·0297	0·1907	0·0990	0·1518	0·1221	0·2920	0·0016	..	25	..	..	..
Pork fat	30	..	30·0	..	..	..	..	..	..	..	..	..	2	16	..	..	..
Sugar	40	..	..	40·0	..	..	..	..	..	..	..	..	..	..	..	..	..
Baking powder ..	5	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Salt	4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Total—9 muffins ..	..	30·2	33·3	273·6	0·0578	0·1456	0·4846	0·1528	0·4140	0·3235	0·4451	0·0028	581–968	75	..	..	45
1 muffin ..	..	3·3	3·7	30·4	0·0064	0·0161	0·0538	0·0169	0·0460	0·0359	0·0494	0·0003	64–107	8	..	..	5

† Cornmeal mush: Cornmeal weighed dry, cooked in boiling salted water, allowed to cool, sliced, fried in pork fat, and served with cane sugar.
‡ Cane-sugar syrup: Sugar weighed, water added cooked to make syrup.

producing diet were cured in every instance by administration of nicotinic acid and did not recur so long as it continued does not mean that other essential factors are not missing in the basic diet.

SUMMARY AND CONCLUSIONS

1. The prompt improvement in the mucous membrane lesions of severe pellagrins, restricted to a pellagra-producing diet, following the administration of nicotinic acid indicates that nicotinic acid is an antipellagric factor.

2. The fact that the lesions did not recur in the five pellagrins continuing to take nicotinic acid and a basic pellagra-producing diet, and yet did recur in the two pellagrins on a similar diet when the supplement of nicotinic acid was discontinued, likewise suggests that nicotinic acid is an important anti-pellagric factor.

3. The importance of nicotinic acid as a potent therapeutic substance is indicated not only by the fact that certain specific symptoms of pellagra disappear promptly following its administration, but also by the fact that the patient receiving nicotinic acid rapidly regains strength and has an increased sense of well-being.

4. While these observations show that nicotinic acid induces healing of certain pellagrous lesions while the person continues to take the pellagra-producing diet, it is not in any sense recommended that pellagrins be treated by means of a pellagra-producing diet plus nicotinic acid. It seems to us that pellagra-producing diets are deficient in a number of chemical substances.

5. The disappearance of the increased coproporphyrinuria following the administration of nicotinic acid seems of importance in the pathogenesis of the disease.

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BIOLOGICAL POLYVALENCY OF ANTIGENS

WITH SPECIAL REFERENCE TO HAY-FEVER

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Evidence for the antigenic homogeneity of the English grass-pollens was last summarised by one of us (Freeman 1933) when again it was shown that the pollens of all the grasses under examination were antigenically of the same type—i.e., if a patient reacts to any one of the grass-pollens he reacts to them all. Further, if the patient is successfully desensitised with, and to, any one pollen, he also ceased to react to any of the others. No evidence has since appeared to throw doubt on these results, though it is clearly impossible to make specific tests on every one of the five or six hundred varieties of English grass, and it seems fair to deduce that so far as practical diagnosis and desensitisation are concerned, all grass-pollens may be taken as the same.

But there is another method of reinforcing this conclusion. This is to select a few of the graminæ which, though they are biologically speaking of the grass family, are yet as far removed as possible from our English Timothies, cocksfoots, Yorkshire mists, &c. We wanted them far removed not only in place of origin and in general botanical characteristics but also in the respect that they are not to any considerable extent cultivated in this country. For this purpose Indian corn (maize), bamboo, and sugar-cané were selected; taking them by and large it may be said that their pollens fall into line with the indigenous English grasses from the antigenic point of view.

THE MATERIAL

Maize.—Tests continued now for several years have shown that maize-pollen behaves antigenically in the same way as the pollen of the English grasses, though the extract from it is not so strong for a given weight of pollen, possibly because maize-pollen grains are themselves much heavier than for example those of Timothy grass.

Bamboo.—Pollen goes mouldy very quickly if at all damp, but after many years of failure a very small quantity of good bamboo-pollen was obtained from Ceylon. All the results of the prick tests made with this, both positive and negative, tallied exactly with results from English grass-pollens; not only were known hay-fever cases tested with positive results, but non-hay-fever control cases were also tested. A few of these "negatives" were normals—i.e., non-allergics—but for the most part they were selected from an asthma clinic; two of these unexpectedly gave a reaction to bamboo, but on testing with Timothy pollen also these two were found to be true, but as yet unsuspected, hay-fever cases. On other occasions three cases sent to the hay-fever clinic with notes from their practitioners declaring them to be "undoubted cases of severe hay-fever" failed to give the bamboo test, but failed also to react to Timothy grass.

Sugar-cane.—Large quantities of the Jamaican sugar-cane were very kindly collected for us by Mr. H. L. Sampson of Kew, from the wild as well as from the cultivated varieties; however, as we found that *Sacchanum officialis* and *spontaneum* gave in all their skin reactions identical results, there is no need to differentiate them here. We may say at once that sugar-cane pollen shows a very close similarity to pollens of all the graminæ we have tested—far closer for example than to the pollens of the garden flowers, but as it does show some slight differences our results should be given in full. The cane-pollen—which had been extracted and standardised in our usual way—was used together with Timothy pollen for routine diagnostic prick tests, and the resulting weals were traced off on to prepared slides after 15 min.

THE EXPERIMENTS

For convenience women and children only were used for these experiments as we wanted to test as many as possible several times during the course of treatment. The cases were in all respects unselected save that they were reputed to be hay-fever. In no instance did we get a positive cane reaction among the non-hay-fevers—i.e., among those who did not react to English grass-pollen. These are therefore not referred to again. None of the people giving a positive sugar-cane reaction had ever lived in a sugar-cane country. The results are summarised in Table I.

It will be seen that in the majority of the cases there is no detectable difference between the cane and Timothy pollens, and in those cases where there appears to be some difference, most are within the limits of experimental error. Not all the differences however can be explained in this way, since in three cases there was no reaction to cane in the presence of a sharp reaction to Timothy. These were all retested on several occasions and with greater concentrations of the pollen extract, but persisted in being negative or negligible to cane, while Timothy pollen gave the normal positive reaction.

TABLE I—COMPARISON OF SKIN REACTIONS TO SUGAR-CANE AND TIMOTHY-GRASS POLLENS

Total cases examined	123
Timothy equal to cane	86
„ rather less than cane	12
„ „ more „ „	22
„ positive, cane negative	3
„ negative, „ positive	0

TABLE II A

Cases having several series of tests	68
Decrease equal for Timothy and cane	47
Lag in decrease to cane	21

Table IIA analyses those patients that appeared for skin tests often enough for the progress of their treatment to be followed more fully. The term "lag" is used to indicate that in these patients the reaction to cane did diminish, but rather more slowly than the reaction to Timothy; there was a slight delayed response which suggests some antigenic difference.

TABLE II B

Total cases showing complete loss of reaction on treatment with Timothy	15
Complete loss to both Timothy and cane	6
Some sensitivity to cane alone	9

It will be seen in Tables II A and II B that it was only in the minority of cases that the reactions do not tally very completely, though the majority behave in exactly the same way to both.

For comparison most of the patients were tested with three other pollens, daffodil, heather, and michaelmas-daisy. These were chosen because they are fairly well-separated families, and because the two latter pollens do account for a certain number of cases of seasonal rhinorrhœa often described as "hay-fever." These "garden-flower" pollens are, in contrast to grass-pollen, clearly different antigenically from the whole group of graminæ.

TABLE III—REACTIONS TO GARDEN-FLOWER POLLENS IN HAY-FEVER SUBJECTS

Total tests recorded	48
Dermographic	9
Positive to one pollen	8
(*a*) Michaelmas-daisy	6
(*b*) Heather	2
Positive to two pollens	11
(*a*) Michaelmas-daisy and heather	9
(*b*) Michaelmas-daisy and daffodil	2
Positive to all three pollens	1
Total positive	20
Total negative, at least	28*

* Probably about 75.

Unfortunately all the negative results were not recorded, though all the positive reactions were traced; the proportion of positive reactions given in the Table is therefore too high. The term dermographic has been used to describe those cases where the normal saline and the three pollens react equally, and are regarded as negative. In nearly all the positive reactions the weal was not so large as those given by the Timothy and the cane, but in two cases they were about equal in size, and were associated with histories of clinical "hay-fever" in the autumn. Both were to michaelmas-daisy.

There is a further interest in this biological spread of antigenic properties apart from the treatment of hay-fever. Much evidence has accumulated during the last 20 years that the compositæ share many antigenic characteristics. This is of the greatest importance in the U.S.A. where their Fall "hay-fever" from compositæ even outweighs in intensity their true hay-fever from grasses of midsummer; to a less extent it is of course important here in England where the trouble from michaelmas-daisy pollen in September and October is second only to our June hay-fever, as was shown by one of us several years ago.

It will be recollected that in 1920 it was demonstrated (Freeman) that horse-asthmatics are sensitive also to all the equidæ—i.e., to donkeys, zebras, kiangs, and onegas. Similarly there is abundant clinical evidence, gleaned from Regent's Park Zoo, that patients sensitive to cats are sensitive also to the felidæ in general—great and small. Similarly not only do all the different dogs go together as one might expect, but foxes and wolves go with them. The weasel tribe has a common antigen as shown by fur-eczema and fur-asthma. We have noticed moreover that people sensitive to vegetable marrows are sensitive to cucumbers and melons, and presumably to the rest of the gourd family. The mioplasms of all the fishes run together so far as we have tested them. It seems to us therefore that in place of making mixtures of pathophanes in order to carry out group tests—a practice which has serious disadvantages—more close attention should be paid to biological relationships.

Those who wish to cling to the hypothesis that a sensitisation process by the peccant antigen always takes place (thus falling into line with anaphylaxis) are at liberty to explain some of their difficulties by supposing that when a person is found to be sensitive to a protein with which he has never yet come into contact he has become sensitive by contact with a close biological relative. Thus he may become sensitive to bamboo-pollen by contact with the English Timothy, and to the zebra by perhaps the horse-manure in his English garden. It is interesting that whereas hen's eggs and pheasant's eggs, which are closely related biologically, are antigenically identical, hen's eggs and duck's eggs do not necessarily give the same reactions—though they usually do.

By the end of the season these results appeared sufficiently definite to justify our desensitising a case of hay-fever with cane-pollen. The desensitisation reduced the skin reaction to both pollens equally, and the treatment was clinically successful.

CONCLUSIONS

1. Foreign grasses not grown to any extent in this country give positive skin reactions in people with hay-fever who have not previously been exposed to them.

2. Maize- and bamboo-pollens could not be distinguished antigenically from the English grass-pollens.

3. Sugar-cane pollen behaves in the same way as English grass-pollen in the majority of cases.

4. There is a slight antigenic difference between cane-sugar pollen and the others, indicated by a minority of the cases which were desensitised with

Timothy losing their reaction to cane more slowly. Also three cases were found which were not sensitive to the cane-pollen, but which were definitely sensitive to Timothy.

5. A comparison between the pollen of the graminæ and pollen of the garden flowers showed that such markedly exotic "grasses" as maize, bamboo, and sugar-cane are far more closely related to the English grasses antigenically than to the English garden flowers.

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DIASTOLISATION IN CATARRHAL CONDITIONS OF NOSE AND MIDDLE EAR IN CHILDREN

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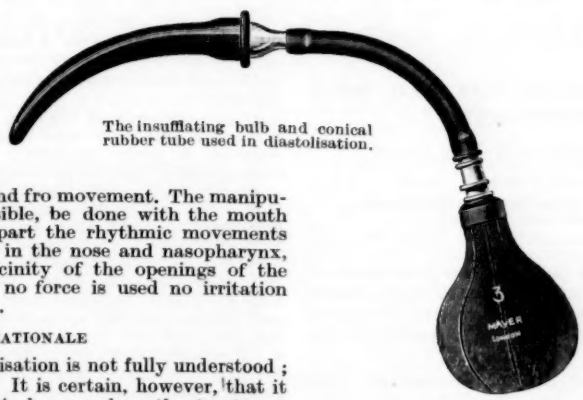
George Gautier first described diastolisation in 1924. It was subsequently introduced into this country in 1926 by Arthur Wells and is now extensively used in L.C.C. clinics. Diastolisation got its name from the similarity of movements produced by systole and diastole.

The following is a brief description of this treatment.

TECHNIQUE

The nasal cavities are first of all cleaned by instructing the patient to blow the nose, one side at a time. Conical hollow rubber tubes (see Figure) open at one end are dipped in liquid paraffin and are gently introduced into the nasal passages until they reach the pharynx. An insufflating bulb is attached to the open end of the tube, and by alternately compressing and releasing the bulb, corresponding movements are imparted to the bougie, the whole tube being at the same time given a to and fro movement. The manipulation should, if possible, be done with the mouth closed in order to impart the rhythmic movements of the bulb to the air in the nose and nasopharynx, particularly in the vicinity of the openings of the Eustachian tubes. If no force is used no irritation follows this procedure.



The insufflating bulb and conical rubber tube used in diastolisation.

RATIONALE

The action of diastolisation is not fully understood; one can only surmise. It is certain, however, that it is not merely mechanical; nor does the treatment aim at merely distending the nasal passages. The distension produced is more due to retraction of the mucous membrane and underlying soft tissues as the result of the stimulation caused by its contact with the bougie, than to pressure. The sympathetic and other nerve-endings in the nasal mucosa and its connexions with the sphenopalatine ganglion regulate the vasomotor and secretory function of the mucous membrane lining the nose, sinuses, and probably middle-ear cleft. There is also a reflex connexion between the nose on one side and bronchial tubes and diaphragm on the other, via the first and second branches of the Vth nerve to the motor roots of the vagus. It is thought that the stimulation of these nerve-endings in the nose by diastolisation encourages glandular activity of the mucosa and tends to re-establish the normal flow of lymph. It is also believed that the respiratory system and diaphragm are stimulated at the same time by reflex action.

In persistent mouth-breathing the nasal mucosa has become inert and less sensitive to the stimulating effect of the air striking it. This would explain why, sometimes, after a successful adenoidectomy, when a clear airway has been established, nasal breathing is not, or is only partially, restored. This fact has long been recognised by a number of rhinologists who make a practice of ordering breathing exercises after every tonsil and adenoids operation. Again, if the air cannot enter the nose and its stimulating effect on the mucosa is lost, the reflex stimulation of the lungs and diaphragm will also be impaired. For this reason, when a child keeps his mouth open the excursions of the diaphragm are poor, air entry in the lungs is deficient, massage of the liver and intestines which follows the movement of the diaphragm is slight, and nutrition is impaired. This has been proved by Pech (1921) with the "masque manometrique" that he invented, which registers the respiratory flow in metres per second. Readings were taken before nasal treatment was begun and again when nasal respiration had been re-established. Pech and Genevois were able to show with this instrument that the respiratory flow was increased after nasal respiration had been restored by diastolisation. The thoracic indices (the measurement of the excursion of the diaphragm) as seen by X ray examination improved, in some cases, twofold after this treatment.

INDICATIONS

The principal aims of diastolisation are first to restore nasal respiration in cases of hypertrophic rhinitis, and secondly to treat conditions very often due to nasal insufficiency, such as mouth-breathing, Eustachian catarrh, catarrhal deafness and sinusitis.

In the *new-born child and infant* diastolisation is particularly indicated as a restorer of nasal breathing where the usual form of surgical treatment is impossible. Nasal obstruction in the infant, if one excludes syphilis, is due either to adenoid tissue or to thickening of the nasal mucosa. The danger of mouth-breathing, with its resulting damage to the middle ear, is a real one in the infant, because the Eustachian tube is short and horizontal and the opening very wide. The nasal catarrh caused by mouth-breathing produces a continual discharge, which is swallowed in the day-time and often finds its way into the trachea at night. A simple superimposed coryza may then give rise to inflammation of the middle ear and to pulmonary and other complications. Wisner (1928) and Worms (1925) have treated a great number of infants suffering from nasal insufficiency by diastolisation, some after an adenoidectomy. All of them showed definite improvement both locally

and generally, which persisted. My own experience is limited to three infants suffering from chronic suppurative otitis media with mouth-breathing; the discharge was mucoid. Nasal breathing was established after diastolisation and the ears dried up shortly afterwards.

My main experience in diastolisation, however, has been with *school-children*, while treating them in connexion with the audiometer tests. These tests are directed by Mr. Arthur G. Wells, and L.C.C. school-children have been subjected to them on a large scale since 1934. Two consecutive tests are made and those who fail to pass them are referred to the aurist for investigation. There are a variety of causes for this failure, such as chronic—or past—suppurative otitis media, antecedent mastoid operations, or cerumen[1]; but the great majority of cases of defective hearing were found to be due to chronic catarrh of the Eustachian tube and middle ear, with or without indrawn tympanic membrane. In the presence of mouth-breathing, hypertrophic rhinitis, or catarrhal sinusitis, most of the children referred to me for investigation were ordered a course of diastolisation, unless an enlarged or infected pad of adenoids was present, or a badly deflected septum. The course consisted of twelve treatments, administered twice a week; very often two to three courses were required. The result of this treatment on the hearing will be seen from the above figures issued by the L.C.C. These figures show that about 47 per cent. of the children to whom this treatment was given had sufficiently improved to pass the third test, which is that of normal hearing; while about 24 per cent. benefited by it to a lesser degree. The remainder showed no improvement.

—	*1935.*	*1936.*
Total examined	28,038	45,579
Failed first two tests ..	2,201	3,755
Diastolisation: total	184	591
Passed final test	88	269
Improved only	33	155
No improvement	63	167

SUMMARY

No extravagant claims are made for diastolisation. It is useful when treating hypertrophic rhinitis, catarrhal sinusitis, Eustachian and middle-ear catarrh with associated deafness, nasal insufficiency due to persistent mouth-breathing, and non-use of the nose. It stimulates the nerve-endings of the indolent nasal mucosa and re-educates nasal breathing, thus improving pulmonary respiration.

To the usually recognised function of the nose of warming, purifying, and moistening the air must be added that of the stimulating effect produced by the air striking the nerve-endings of the mucosa.

The main object of this article has been to stimulate interest in an important but perhaps somewhat neglected subject, and to induce other rhinologists to use diastolisation—a treatment which I myself took up in the first place with scepticism.

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CLINICAL AND LABORATORY NOTES

A CASE OF PELLAGRA TREATED WITH NICOTINIC ACID

By J. C. Hawksley, Ph.D. Birm., M.D., M.R.C.P. Lond.

ASSISTANT PHYSICIAN TO UNIVERSITY COLLEGE HOSPITAL, LONDON

The use of nicotinic acid in the treatment of pellagra has recently been described by Spies (1938). He records the rapid disappearance of symptoms in fifteen patients. The following note describes a case similarly treated.

A schoolmaster aged 28 was admitted into University College Hospital on Feb. 3rd, 1938. In 1931 he had complained of indigestion and vomiting which were relieved by diet; symptoms recurred in 1933 when a barium meal showed no abnormality; his appendix was removed. Subsequently he had recurrent attacks of epigastric pain which were often relieved by vomiting; no ulcer was discovered by radiography, but a very strict diet was recommended. Thenceforward he had subsisted for the most part on milk, cereals, and a little egg, fish, bread and butter; according to his mother the quantities eaten had been very meagre and a vicious circle had been established in which any increase in this diet caused pain and vomiting. There was at no time any radiographic evidence of ulcer. His weight gradually diminished.

In the summer of 1937 he drove for ten miles in a car and one hand was exposed to sunlight; this resulted in severe sunburn; the patient from then onwards protected his face and hands from the sun.

In February, 1938, he was admitted for investigation. He was wasted and weighed 8 st. 12 lb., was depressed and apathetic, and had a sore tongue and frequent loose and offensive stools; follicular hyperkeratosis was present on and around the nose and in the nasolabial folds, where plugs stood out from the follicles. The cardiovascular system, urine, lungs, and central nervous system showed no abnormality the abdomen was tympanitic but otherwise normal; a blood count showed mild microcytic anæmia, fractional test-meal hyperchlorhydria, the stools no excess of fat. A barium meal showed no organic lesion of the alimentary tract but considerable flatus and hyperperistalsis. Temperature, pulse, and respiration-rates were normal. Cholecystography was negative.

On Feb. 25th nicotinic acid treatment was begun in doses of 90 mg. daily by mouth, the dose being doubled on March 10th. By Feb. 28th his tongue had become normal, his depression had gone, and his diarrhœa had stopped. The follicular hyperkeratosis was seen to be diminishing daily and by March 23rd, the date of discharge, had nearly disappeared. He was given a liberal diet and tended to get colic from time to time, but stated that his appetite, previously poor, had returned. His weight, which had dropped to 8 st. 9½ lb., did not begin to increase till March 18th.

In this case symptomatic improvement was rapid, but it is interesting to note that for three weeks

[1] It is interesting to record that there were 5 children with congenital absence of the auditory meatus amongst the 4000 children I examined.

the patient's weight did not respond to treatment on a full diet, whereas in a recent case treated with the filtrate factor from liver (Yudkin, Hawksley, and Drummond 1938) the gain in weight was rapid. The filtrate factor may contain more factors than one; on the other hand the dose of nicotinic acid used in this case was small.

This note may serve as a warning of the effects of dietetic restriction imposed for a set purpose but carried to excess during a number of years by an over-conscientious patient.

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SEVERE HÆMORRHAGE FROM A MECKEL'S DIVERTICULUM

By H. F. Moseley, M.Ch. Oxon., F.R.C.S. Eng.
RESIDENT ASSISTANT SURGEON, ST. THOMAS'S HOSPITAL

A fat boy aged 8 was brought to St. Thomas's Hospital because of severe melæna of three days' duration. The melæna was preceded by an attack of abdominal pain, with vomiting. There was a history given that two years before he had had similar abdominal pain, lasting three weeks, but no melæna was observed.

On examination the patient was obviously anæmic—hæmoglobin, 44 per cent.; red cells, 2,000,000; colour-index, 0·8; polychromasia was present. The abdomen was tender on palpation around the umbilicus, but nothing more definite was found. Proctoscopy was negative.

In view of a previous case reported last year by Card and Mimpriss the correct diagnosis of a bleeding Meckel's diverticulum was made. Two attempts to visualise the diverticulum by a barium meal examination were unsuccessful. A laparotomy was performed by Mr. B. C. Maybury and a Meckel's diverticulum, 2½ in. long, was found and resected. Fig. 1 shows the ulcer at the junction of the mucosæ between the diverticulum and ileum. This had perforated the whole wall, and the omentum had closed the base of the ulcer externally, preventing the peritonitis that had occurred in the case previously reported. Fig. 2 shows that the mucosa of the diverticulum is as found in the stomach, with oxyntic cells. This passes into the ileum through an area which has the appearance of duodenal mucosa.

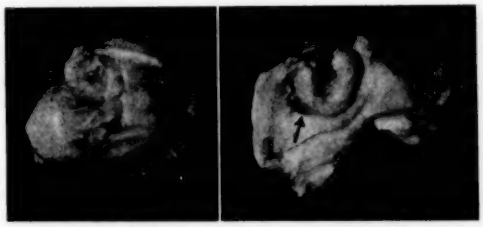

FIG. 1.—The diverticulum. Left: external view showing piece of omentum overlying the site of the ulcer. Right: the ileum opened longitudinally, the arrow showing the ulcer.

The patient made an uninterrupted recovery and was perfectly free of abdominal pain and melæna when last seen.

I wish to thank Mr. Maybury for permission to publish this case.

Reference.—Card, W. I., and Mimpriss, T. W. (1937) *Lancet*, 2, 963.

FIG. 2.—Photomicrograph showing change in type of mucosa between the diverticulum (on left) and the ileum.

THE LANCET 100 YEARS AGO

April 21st, 1838, p. 122.

From a leading article on the improved health of the navy.

Before the reign of Henry VIII. and Elizabeth, when the first large vessels were built, we read little of scurvy and ship fevers. Ventilation was inevitable in small open ships. Before those periods, too, long voyages were rarely attempted, and our navies were never stationed on the destructive coasts of Africa, or the West India Islands. In the Crusades (1250), scurvy ravaged the fleet of St. Louis. The English fleet of 49 sail, raised to combat the Spanish Armada, carried 14,872 men; each of the four largest ships had 1000 men aboard. Sir Richard Hawkins, one of the admirals, relates, that in the course of 20 years, he had known of 10,000 seamen having perished of scurvy alone. Scurvy almost invariably broke out in long voyages, which became frequent in the 17th century; . . . fever and dysentery were still more fatal. The Channel fleet sent 11,732 cases of sickness to Haslar Hospital, in 1780; 1457 were cases of scurvy, 240 of flux, 5539 of continued fevers! . . . This is a fair specimen of the health of large fleets down to the end of the 18th century; neither ships nor men could keep the sea for more than two months. . . . The improvement in the health of the Navy during the 36 years from 1779 to 1815, is ascribed by Sir Gilbert Blane, in the first place, to the general distribution of lemon juice and nitric acid in the Navy, from 1796. Its virtues were previously known, but had never been extensively applied before the appearance of Lind's classical "Treatise on Scurvy." . . . (2.) To improvements in ventilation and cleanliness. The sailors began to wash themselves and their apparel; they were first allowed soap in 1810; and Earl St. Vincent had their hammocks and beds aired twice a week so early as 1800. (3.) The dryness promoted by fires carried about in stoves. (4.) The use of iron for ballast, and of iron tanks for the preservation of water. (5.) Mr. Sepping's improvements in the construction of ships, by which cavities under the hold are abolished, where filth and vermin of every description accumulated; . . . (6.) The superior quality of all their articles of victualling; the plentiful supply of fresh meat and vegetables when ships are in port, or within reach of it (7.) And, finally, the better treatment of the sick.

MEDICAL SOCIETIES

ROYAL SOCIETY OF MEDICINE

UNITED SERVICES SECTION

AT a meeting of this section held on April 11th, Colonel A. G. BIGGAM, a vice-president, took the chair and a discussion on the organisation of medical services in

Air-raid Precautions

was opened by Colonel E. M. COWELL. He said that it would be necessary to anticipate a casualty inflow of about 22 killed and 40 wounded per ton of bombs dropped. Bombers would attack in closely massed formations of probably not more than 36 machines each, which would cover an area of about a quarter of a square mile. One of these formations would probably cause 1000 casualties in a night attack and 2700 in a day attack. Successive relays of machines might attack the same area. The casualties would, of course, include many women and children, and their handling would be complicated by the presence of friends and relatives. The medical services for air-raid work had been organised on military service lines, and included first-aid parties, first-aid and cleansing posts, ambulance services, cemeteries, and central mortuaries. The medical officer of health was in charge of all arrangements, and medical headquarters must be kept in touch with local authority headquarters and notified of all events. Records must be kept at the Ministry of Pensions so that relatives could be notified of casualties. The Home Office had so far made no provision for the services of consultants. These should be appointed immediately and should assist in the training of medical volunteers. A large medical staff would have to be organised. It would be useless to allow each local authority to organise its own services in isolation. A central staff must coördinate the work of the various authorities, so that if one were overwhelmed by casualties the services of an immune neighbour could come to its assistance. Members of the public would probably have to be given identity discs or medical cards.

A densely populated area required a total personnel equal in size to one-thirtieth of the population. The medical personnel would be one for every fifty. For Croydon, for example, with a population of a quarter of a million, the staff would therefore number 5000. This figure included stretcher-bearers, orderlies, and nurses, and allowed for three eight-hour shifts. The whole medical profession would have to be mobilised. Dental surgeons would be useful as anæsthetists or as assistants to surgeons; no plan had yet been made for mobilising medical students, who would also fill these posts. Territorials might be used, before they were moved on to their training areas; and all ranks should therefore be given some knowledge of stretcher-bearing, protective clothing, and gas.

Air raids would probably be made without warning. Previous propaganda was very important in allaying panic. Each person in a town should carry a shell dressing, and air-raid wardens should carry more than one. These would be more useful than gas respirators. Casualties would be first found by their friends, police, firemen, and air-raid wardens, who would render first-aid and hand them to the ambulance squads, who would carry them to first-aid posts. The Home Office advised the provision of 20 first-aid parties of four men each for every hundred thousand head of population. They must be prepared to work in gas-proof clothing, which was very irksome, and possibly also in respirators and mittens. The most useful form of haversack would have a "zip" fastener and contain a few shell-dressings and triangular bandages. Only the simplest kind of first-aid should be attempted under the difficult conditions of a "black-out." Stretchers were best carried in hip slings, which allowed two men to carry a stretcher with their hands free. The patient would be secured in such a way that the stretcher could be carried in any position. For work in gas, stretchers might have metal poles and a sheet which could be easily decontaminated. Motor ambulances could be quickly improvised from light vans by fitting a rough wooden framework, which any carpenter could make in a short time, to hold stretchers. In the same way railway passenger rolling-stock could quickly be converted to carry stretchers.

Schools were the most suitable places for first-aid posts. Special plumbing, cleansing rooms for gas casualties, and other additions had to be made, at a cost of between £500 and £1000 for each school. The buildings could not be made bomb-proof, but parts of them could be made splinter-proof. They ought to be fireproof, but it would be difficult to make them gas-proof. Trenches should be dug in the playground, revetted, and covered with a layer of sandbags. New hospitals should have flat roofs, which could be covered with concrete to stop incendiary bombs. Casualties would have to be kept in the first-aid posts for some time, and fed to the clearing hospitals in convoys as they could be dealt with. The sexes had better be segregated by screens than in separate buildings, as the ratio of numbers would vary. Each post must have an alternative site, in case it was destroyed, and reserve personnel should be in readiness. The personnel would number fifty, excluding a doctor and four State-registered nurses, for each eight-hour shift.

The casualty clearing hospital would probably have to be established in existing buildings. The local hospital would be the best site, and schools might have to be used as well. The lay-out should be arranged to give the quickest possible access to ambulances and stretcher-bearers. A site at a cross-roads therefore had advantages. Casualty clearing hospitals must be grouped together, and as each one was filled up it should be closed and the next one opened. The pivotal point of each hospital was the theatre block, which was conveniently formed by dividing huts into three theatres and splint room, each theatre to have two tables with an instrument table between them. Base hospitals and storage depôts would also be required. One thousand walking and 700 lying cases could not be dealt with in under 25 or 30 hours.

DISCUSSION

Air Commodore WILLIAM TYRRELL maintained that air defence would have to be arranged on national lines. At present the Home Office, the British Red Cross, and St. John Ambulance were each organising departments to suit their own particular requirements. To meet the realities of the situation the arrangements must be centrally coördinated on basic principles applicable equally to civilian and Service emergencies. Basic text-books would have to be compiled on the same lines as the Home Office publications, with uniformity in terminology, pro-

cedure, and technique. Application should be elastic enough to fit each set of circumstances. Such control would help considerably to avert the most important result of air attack: panic. Nowadays the base hospital was just as likely to be a target as the first-aid post, so the old Army division into four sectors, with its assumption that casualties would only occur in the forward area, was obsolete. Arrangements for collection must be provided in every part of the country, and each area must be prepared to stand by to help a neighbour which had all its services destroyed. He asked how a gas-contaminated patient who was also suffering from shock and collapse should be treated.

Dr. J. N. DOBBIE pointed to the divided control that at present existed in London. The first-aid posts and parties were under the metropolitan boroughs, and the accommodation for casualties was under the large hospitals and L.C.C. hospitals, which were scattered through the various boroughs. The phrase "casualty clearing hospital" was a misnomer; many casualties would be taken there direct, and it was in the front rank. Casualties would have to be evacuated well outside London. The authorities should consider immediately the establishment of tented hospitals on the periphery. The National Fitness campaign and similar movements requiring large camps would provide opportunity for the Government to establish these hospitals at once. Schools did not make good hospitals, because their ground plan did not allow for a proper flow-through of wheeled transport. The terrible lack of cohesion between the different authorities was a great problem.

Dr. DONALD STEWART said that Colonel Cowell's address was of the greatest practical value to those like himself, who had been asked to draw up a medical A.R.P. scheme for a large community. He had found difficulty so far in obtaining helpful information apart from the excellent handbooks published by the Home Office. If gas was to be a problem in the next war the decontamination of those already severely injured must take an important place in first-aid instruction. Dr. Stewart also emphasised, as an essential part of the scheme, that A.R.P. volunteers should be given systematic general training and some understanding of discipline, not only in order to do their job effectively but also to form a stabilising and "anti-panic" factor in any emergency. If metal stretchers were used, as Colonel Cowell had suggested, the inclusion of some of the new light alloys might reduce lifting weight. Metal stretchers should be decontaminated more easily than those made of canvas and wood. The civilian clothing issued for training purposes was still susceptible of improvement in design. The problem of rehabilitation and return to work of people injured in an air raid should be considered now as part of the whole scheme since emergency measures had a bearing on these problems.

Surgeon-Commander S. G. RAINSFORD said that Admiralty work on the use of gas-proof clothing had shown that men could wear it for a surprisingly long time.

Group Captain G. STRUAN MARSHALL suggested the use of a gas-proof tent made of oiled fabric, impervious from the outside, and containing a small apparatus for absorbing carbon dioxide and releasing oxygen. Its soft walls would stand much blast without breaking. Metal-framed stretchers, even of steels, could be made sufficiently light for practical use.

Dr. W. D. WALKER said that shocked patients should be decontaminated first, but must be kept warm until this was done, and then given normal saline and glucose. All medical officers should have an opportunity to be trained in anti-gas measures. He was anxious for training, but had been unable to obtain it.

Colonel COWELL, in reply, said that his paper would be published in the *Journal of the Royal Army Medical Corps*. He emphasised again the need for central coördination, pointing out that the tactics of air attack made it probable that damage would be localised. Serious cases must not be sent direct to the casualty clearing hospital, or they would swamp it. Of the five general hospitals being organised as base hospitals for London, each was well on the outskirts. He warmly approved the establishment of holiday camps with the idea of conversion into hospitals, but suggested that if they were established now, they would probably be photographed and marked down as targets. They should be planned now, but only erected, under camouflage, when the emergency arose. The difficulty which confronted a local authority in dealing with volunteers was not to recruit them but to maintain their interest for an indefinite period—until either air force was disbanded or the Millennium came!

ABERDEEN MEDICO-CHIRURGICAL SOCIETY

AT a meeting of this society held on April 7th, with Dr. H. E. SMITH, the president, in the chair, an address on the therapeutic uses of progesterone, the corpus luteum hormone, was given by Dr. SUSAN PATERSON (Edinburgh).

Progesterone in Pre-eclamptic Toxæmia

In the course of her address she said that 30 cases of pre-eclampsia had been treated with progesterone, the majority being severe cases. Nephritis was first excluded, and a basic number of precautions were taken—namely (1) a balanced diet of approximately 1650 calories was given, not salt-free and not protein-free, but without red meat; (2) wherever there was much œdema the fluid intake was restricted to less than 40 oz. until the fluid output was greater than the intake; and (3) if headache was severe, phenobarbitone was given. Progesterone was injected intramuscularly in doses of 5 mg. daily for the first three or four days, and thereafter, depending on response, at longer intervals. In certain cases where no response was noted after one day, 10 mg. was given on the second, third, and fourth days. All the patients recovered and only one mother developed fits after treatment had started; they began on the second day. The results obtained in severe cases in the year before progesterone was used and in the following year could be compared as follows:—

	Conservative (31).	Progesterone (22).
Developing fits	10	.. 1
Maternal deaths	3	.. 0
Fœtal deaths	10	.. 7
Corrected fœtal deaths ..	10 = 32 %	.. 3 = 14 %

The use of corpus luteum hormone in pre-eclamptic toxæmia was suggested by Robson's experiments on rabbits, which seemed to prove that the health of the placenta depended on the health of the corpus luteum and that toxæmia was the direct result of the placenta being no longer healthy. Treatment by

progesterone was a substitution therapy; it would not revivify areas of placenta damaged past repair, but it would help to maintain the health of the part of the placenta still functioning. Obviously the earlier the deficiency of corpus luteum was recognised and corrected, the better would be the results, and in severe cases of pre-eclampsia, conservative measures (rest in bed, attention to bowels, &c.) were necessary to deal with the toxins in circulation. If this theory was sound, the dangers of eclampsia could be almost eliminated if patients with the earliest signs of pre-eclamptic toxæmia were given progesterone.

Prof. DUGALD BAIRD said that 65 cases of pre-eclampsia had been treated without progesterone at Aberdeen Maternity Hospital in 1937 with no maternal deaths, and 8 fœtal deaths. These results were as good as those achieved with progesterone. If the hormone was to be employed it would probably be most useful at the sixth month in cases with early rise of blood pressure, and without albuminuria.

LIVERPOOL MEDICAL INSTITUTION

A MEETING of the institution was held on March 17th, with Dr. E. GILBERT BARK, the president, in the chair.

Dr. A. G. C. FFOLLIOTT read a note on a case of

Thrombosis of the Inferior Vena Cava

The patient was a married woman, aged 59, with four children. She had suffered from varicose vein in the right leg since the age of 18 without any trouble being caused. Thrombosis occurred in the middle third of the leg and extended proximally at the rate of two inches a day. On the seventh day a non-fatal pulmonary embolus occurred. The thrombosis extended and was indicated by swelling of the right leg when it reached the junction with the femoral vein, swelling of the lower part of the back and buttocks due to obstruction of the hypogastric vein, swelling of the left leg when the junction of the common iliac veins was reached. Eventually suppression of urine and coma occurred, due to obstruction of the renal veins. This persisted for three days, after which time the kidneys began to function, and the patient also made a slow recovery and was now in perfect health. The interesting features were: the steady rate of extension of the thrombosis; the establishment of a collateral circulation by the azygos and hemi-azygos and lumbar veins; the return of kidney function after three days of suppression; and the eventual recovery of the patient from an apparently hopeless condition.

Mr. JOHN ROBERTS communicated observations on 120 consecutive cases of

Foreign Body Removed from the Œsophagus and Lower Air-passages

He said that, apart from children, contributory factors in the ingestion and inhalation of foreign bodies were insanity, alcoholism, dentures which limited the sensitive area of the mouth, hunger, and hurry. Any type of mechanical narrowing of the gullet was a predisposing cause. Halfpennies, fish, and meat bones were by far the most common objects, and the large majority became held up in the upper third of the œsophagus. Mr. Roberts had in his collection a girl-guide badge, a shilling piece, a match stick, a piece of metal from a fruit salad tin, and other articles, but his most unusual case was one reported in 1934 in which a man's gullet became obstructed by his own beard. The bronchial foreign bodies formed only about 5 per cent. of the total, and this series included the only object which he failed to remove. This was a small pin, lodged in the basal periphery of the lower lobe of the left lung. The diagnosis was completed by a competent indirect mirror laryngoscopy followed by a skilled radiological screening with opaque paste and cotton-wool—which very rarely failed to betray or indicate an impacted object. In this connexion Mr. Roberts insisted that a skilled radiological emergency service was vital and the responsibility of diagnosis, except of metallic objects, should not be deputed to a radiographer. Mr. Roberts favoured a modern distally lighted tube—more especially one of oval cross-section. He much preferred a general anæsthetic for œsophagoscopy. He outlined the principles on which it is possible to pass a rigid tube down a curving gullet, and the difficulty of endoscopic examination of patients with rigid vertebral columns. In the two fatal cases in the series the foreign body had penetrated the gullet before the patients arrived for endoscopy.

In the discussion Mr. H. V. FORSTER spoke of the difficulty of removing small foreign bodies in the smaller bronchi or at the periphery of the lung; nowadays the biplane fluoroscope was used to help in the recovery of such a foreign body. If a modern tooth plate of stainless steel should be impacted in the gullet it might be divided by an electrically driven burr. Mr. Forster had been very fortunate in his experience of foreign bodies in the gullet, but might have lost two patients with tooth-plate impaction but for the help of general surgical colleagues, who successfully removed by external operation an upper denture fixed below the sternal margin and one impacted behind the cricoid. Peanuts inhaled into a bronchus caused early and dangerous reactions in the lung. Accidents of this kind were common in America where peanuts eaten at baseball matches during the excitement and cheering sometimes found their way into a bronchus.

Dr. REGINALD GEMMELL called attention to the fact that people as a rule were frightened if they swallowed foreign bodies and immediately asked to be radiographed. He showed lantern slides of a man who chewed and swallowed safety-razor blades for bets.

Dr. COTTON CORNWALL expressed surprise that the proportion of foreign bodies found in the bronchi was so small, and suggested that it might increase if bronchography was performed in doubtful cases, since many foreign bodies were radiologically non-opaque. When there was any doubt whether a foreign body had been swallowed the patient should be radiographed, and when one was found in a bronchus every effort should be made to remove it; otherwise pulmonary suppuration was likely to supervene at a later date.

Dr. MURIEL BARTON HALL contributed a Study of Juvenile Nervous and Mental Instability, based upon records of 1000 consecutive cases of young persons in the second decade of life.

BRITISH SOCIAL HYGIENE COUNCIL.—The council will hold a non-residential school at Friends House, Euston-road, London, N.W., from June 20th to 25th, and a residential school at Granville-court, Hornsea, Yorks. from Sept. 6th to 13th. The programme of lectures at the schools is designed for those who have charge of children, who advise parents, or who care for the welfare of adolescents during their working or leisure hours. Further information may be had from the secretary of the council, Carteret House, Carteret-street, London, S.W.1.

REVIEWS AND NOTICES OF BOOKS

Text Book of X-Ray Diagnosis

By British Authors. Edited by S. COCHRANE SHANKS, M.D., Physician in Charge of Out-patients, Departments of Radiology and Electrotherapy, Charing Cross Hospital; Radiologist, Prince of Wales General Hospital; PETER KERLEY, M.D., M.R.C.P., D.M.R.E., Physician to the X Ray Department, Westminster Hospital; Radiologist, Royal Chest Hospital; and E. W. TWINING, M.R.C.S., D.M.R.E., Radiologist, Royal Infirmary, Manchester; Radiologist, Christie Hospital. London: H. K. Lewis and Co. 1938. Vol. I. Pp. 591. 50*s*. Vol. II. Pp. 458. 42*s*.

THIS excellent text-book will be welcomed, not only by radiologists but by all whose interests require authoritative reference to expert opinion on diagnostic points.

The first volume consists of three main sections: the cardiovascular system by Peter Kerley, the respiratory system by E. W. Twining, and the urinary and male genital tracts by C. Jennings Marshall and S. Cochrane Shanks. The cardiovascular section is not very long, but it provides all that is likely to be required in a work of this kind. The special techniques, orthodiagraphy, cineradiography, kymography, and so forth, are described though not in detail, and a simple but adequate account is given of X ray measurements of the cardiovascular shadow. The illustrations are well chosen and the reproduction is so good that all the points referred to in the text are clearly visible. The radiograms of congenital diseases of the heart are particularly striking. The author believes that arteriography will come into use in the future, but rightly deprecates the use of Thorotrast because of the possible carcinogenic properties of the radioactive thorium.

The second section begins with a note on the technique of examination of the chest, which is both practical and thorough. Dr. Twining finds only a limited sphere of usefulness for stereoscopy, but recommends tomography for the location of cavities and bronchial obstruction. The apparatus he himself uses for this purpose is simple in structure and gives effective results. His anatomical diagrams will help all who seek to interpret the relations of complicated structures projected on the screen. The outline of the bronchi is made clear by lipiodol injection, which also shows up such abnormalities as bronchiectasis, congenital cystic lung, and bronchial carcinoma with precision. The shadows due to consolidation from pneumonia, fibrosis, and other causes and their differential diagnosis are discussed and a representative selection of typical tuberculous lesions is portrayed. An authoritative chapter on mediastinal tumours includes such rare types as neurofibroma and thymoma. Some pathologists will not agree with the suggestion that lympho-epithelioma may be found in the thymus, as it is known that reticulum-cell sarcoma can produce the appearance described. The chapter on primary neoplasm of the lung is particularly valuable because of the number of different types it has been possible to illustrate and, although this variety of form indicates the difficulty of diagnosis, radiologists confronted with a doubtful case will certainly gain confidence from its study. A separate chapter is devoted to diseases of the pleura, wherein interlobar effusions are particularly well described.

The section on the urinary tract includes an account of the preparation of the patient and of the radiographic technique for plain films and for intravenous and retrograde urography. The views of the authors on neuromuscular dysfunction in the urinary tract seem to explain certain rare but puzzling pathological syndromes. The radiograms of congenital cystic kidney and of simple and malignant tumours are particularly good, and an unusual illustration shows filling defects caused by blood clots. The differential diagnosis of urinary calculus is always important; the view put forward here is that the site and shape of the opacity are relevant, but that the respiratory shift is too uncertain to be worth estimating. Urography, either intravenous or retrograde, will practically always settle the question whether a stone is present, either in kidney or ureter.

In the second volume Dr. Shanks has taken responsibility for the alimentary tract and the abdomen with the coöperation of Dr. J. St. George Wilson; Dr. Kerley writes on the biliary tract; and Dr. R. E. Roberts on the female genital tract and obstetrics. The alimentary tract has been carefully analysed. Few conditions which could possibly be observed radiologically have been omitted. The importance of watching on the screen the passage of the opaque medium into the stomach in carcinoma of the lower end of the œsophagus might have been emphasised and the description of the control of the entry of the barium enema by pressure of the operator's hand and the posture of the patient are not perhaps sufficiently detailed. Peptic ulceration, both in stomach and duodenum, is particularly well shown. Figures 32 and 33 (gastric), 64 (malignant), and 86, 87, and 88 (duodenal) demand special attention. The chapter on the stomach and duodenum after operation is likely to give help where it is sorely needed. Regional ileitis (Crohn's disease) is clearly described, but there is no mention of a similar condition occasionally found in other parts of the bowel, where it may also be mistaken for malignant disease. The vexed question of the diagnosis of chronic appendicitis is discussed but, although some obviously pathological appendices are illustrated, no stress is laid on the value of radiological signs in this connexion. The account of the thorium air double contrast enema and its uses is excellent and timely. Dr. Kerley's section on the biliary tract shows acute observation; the technique he advises for oral cholecystography appears to be entirely satisfactory in his hands and there seems to be no reason why it should not give equally good results in others.

For the visualisation of the female genital tract, utero-salpingography with lipiodol is recommended by Dr Roberts. The method used is simple and the films obtained show that it is satisfactory. Obstetrical chapters include the early diagnosis of pregnancy, radiological pelvimetry, cephalometry, and the radiological estimation of fœtal maturity, and of the position, presentation, and abnormalities of the fœtus. Various methods are described for pelvimetry and correction tables for Dr. Roberts's own method are supplied. The diameters of both inlet and outlet are measured. The diagnosis of placenta prævia may be attempted from the plain film or by amniography, but a warning is given that the latter method should not be used unless immediate induction of labour or Cæsarean section is contemplated.

The last volume of this ambitious work is yet to come. But since two-thirds of it has well main-

tained a very high standard, there can be no reason to await completion before prophesying its early recognition as a classic among specialised British text-books.

1937 Year Book of General Surgery

Edited by EVARTS A. GRAHAM, A.B., M.D., Professor of Surgery, Washington University School of Medicine. London: H. K. Lewis and Co. 1937. Pp. 827. 12*s*. 6*d*.

IMPORTANT contributions to surgical literature are nowadays spread over so many periodicals that even the specialist finds it difficult to keep abreast of his subject. The general surgeon, however industrious, has to face a task which would be entirely beyond his powers were it not for the help afforded him by such publications as this year book, and he owes a great debt of gratitude to the editor and his collaborators for their judgment in selecting, and their skill in summarising, the numerous papers referred to in the present volume. It is natural that a large proportion of the abstracts should refer to matters of technique, details of wound treatment, the use of chemical and physical agents to promote healing, and to many similar modifications or innovations in surgical craftsmanship. But this book is remarkable for the number of comparatively new principles commented upon, and for several critical reviews which help to clarify our ideas about certain controversial subjects. In the former group are the notes on the management of cerebral abscess, the clinical studies of arterial occlusion, the treatment of cardiac ischæmia, and the recognition of the part played by protrusion of an intervertebral disc into the spinal canal in some cases of sciatica. Among the reviews special attention should be paid to those on tuberculous cervical lymphadenitis, thyroid adenomas, and cholelithiasis; and other matters of considerable importance are the use of cortin after burns, the modifications in maggot therapy for infected wounds, and the treatment of fractures of the internal epicondyle of the humerus. In spite of the myriads of papers on the subject, appendicitis still maintains its steady mortality-rate, but we should be thankful that in this country we are less familiar than are our American colleagues with what they call biliary peritonitis. We must add a special word of praise for the brief notes by the editor; the opinions based upon his personal experience do much to enrich the volume.

Fractures and Dislocations for Practitioners

By EDWIN O. GECKELER, M.D., F.A.C.S., Fellow of the American Academy of Orthopedic Surgeons. London: Baillière, Tindall and Cox. 1937. Pp. 252. 18*s*.

Dr. Geckeler's book sets out to supply concise yet detailed instruction in the management of the more common fractures and dislocations, and is written chiefly for those whose work brings them into daily contact with injuries. Practical considerations are therefore emphasised; one method of treatment alone, in the author's opinion the most useful one, has been described in each case, and the illustrations have been chosen to explain its application in elaborate detail. The whole is full of common sense and contains the shrewd suggestions of one in daily contact with the problems he discusses. An unusual feature in a book of this size, but a commendable one, is the inclusion of a chapter on the fractures of the skull and bones of the face.

Some of the methods differ, as might be expected, from those advocated in this country. The author advises the treatment of fractures of the surgical neck of the humerus in abduction, a position that has been accepted too long on the pseudo-anatomical advice of the Vienna school, and only lately discredited. Full flexion is recommended in the fixation of elbow fractures, without sufficient insistence on its dangers. Early movement in wrist fractures and the subdivision of those at the ankle into many groups are strange to our practice and teaching. The book is nevertheless an excellent one, and may be recommended to those requiring a short treatise on fractures and dislocations which is clear, practical, and well illustrated.

Elements of Medical Treatment

Third edition. By ROBERT HUTCHISON, M.D., Hon. D.Sc. Oxon., F.R.C.P., Consulting Physician to the London Hospital and to the Hospital for Sick Children, Great Ormond-street. Bristol: John Wright and Sons; London: Simpkin Marshall. 1937. Pp. 194. 5*s*.

WHILE Dr. Hutchison's name is on the lips of all his London colleagues as that of the newly elected president of the Royal College of Physicians, it is opportune to remind the wider world of students (and their teachers) in the medical schools of the Empire that he published last year a new edition of this little book on medical treatment. It appeared first in 1926 as a printed version of his London Hospital lectures on elementary therapeutics. It was not a text-book. It just talked about the treatment of some of the commoner diseases and symptoms in such a way as to display the principles that must always govern the right management of patient by doctor. It also gave special attention to prescription-writing, not of the old florid variety but with simplicity and sense. The third edition is little changed: mention of mandelic acid, newer mercurial diuretics, and the like serve to keep the examples up to date, but, naturally, the principles remain the same, and a great deal of therapeutic wisdom is packed into a small space. Students should go on reading this book, especially when their minds are congested with overmuch learning or confused with overmuch teaching; and those of us who have heard or read it already should look through it again, to be refreshed by its directness and common sense and to be reminded of some of the familiar Hutchisonian phrases and quotations.

Disability Evaluation

Second edition. By EARL D. MCBRIDE, B.S., M.D., F.A.C.S., Assistant Professor in Orthopedic Surgery, University of Oklahoma School of Medicine. London: J. B. Lippincott Company. 1938. Pp. 623. 38*s*.

THIS book is an attempt to estimate "personal incapacity" following injury "with arithmetical preciseness." For the man who has already had considerable experience in examining injured workmen and also has a knowledge of working conditions it has undoubted value; but it would be a dangerous tool in the hands of less experienced practitioners. The second edition differs from the first, published in 1936 and reviewed last year in our columns, only in so far that its second paragraph has been brought up to date by the inclusion of certain figures supplied by the National Safety Council in their report for 1936 of the costs of occupational accidents.

THE LANCET

LONDON: SATURDAY, APRIL 23, 1938

AN OVERCROWDED PROFESSION?

THE Government has now given us a definition of an overcrowded house, but we have no definition of an overcrowded profession. In our last issue two correspondents described the medical profession in this country as greatly overcrowded. What did they mean? Had they in mind some particular criterion; for example, that the number of doctors must not exceed one per thousand of the population? Were they regretting that they and their fellow M.R.C.P.'s and F.R.C.S.'s have less chance than their elders had of earning £4000 a year in consulting practice? Or has it been their experience that competent men cannot get a living at all? This last is presumably the probable explanation, for one of them remarked that there may be as many as thirty excellent applicants for a single post. Yet we are left wondering whether this is not quite exceptional. At the nadir of the recent trade depression it was rare for a medical man or woman in sound health to be unable to find some employment, and to-day many provincial hospitals seem to have difficulty in securing all the staff they need. A hospital asking for an assistant secretary at quite a low salary may get a hundred applications, often from men of wide experience; while the same hospital may have few replies, or none, to its advertisement for a house surgeon. At a time when constructional work was at a minimum the medical profession seemed especially favoured, and in the renewal of prosperity it has indirectly had its share.

The immediate reason for raising this cry that the profession is overcrowded is the influx of Jews from Germany and the potential influx of Jews from Austria. The anxiety expressed about this invasion seems excessive when one learns that since 1933 only 187 medical refugees from Germany have been allowed to settle and follow their profession in this country[1]—a figure which represents only 0·31 per cent. of the names on the Register. Somewhat unfortunately, however, it happens that many of these have undertaken medical work in a quarter where there really does seem to be overcrowding—that is to say, in a branch of work where there are not enough fees to provide adequate incomes for everyone—and the molehill they have created is apt to look slightly mountainous. It is true that the intensification of competition that has resulted from the addition of a few German names to the door-plates of the Harley-street area can really be having very little effect on the actual incomes of doctors already established there. The overcrowding of Harley-street is a social phenomenon with old endogenous causes far more important than the new exogenous ones. Yet if there were only a single German refugee in consulting practice, his presence might still rankle if he appeared to be taking advantage of the hospitality which has been extended to him (however ungraciously) by this country. And there is in fact a touch of unfairness in the competition. At first sight one might suppose it would be extraordinarily difficult for any such person to establish himself without the advantage of hospital appointments or a wide acquaintance; all the cards seem to be against the refugee. But this is not so. Some of those now in London have apparently been able to retain money enough for a good start in practice, and all have profited by the belief of the public in the superior merits of foreign doctors—a belief by no means diminished by references, in newspapers and elsewhere, to the distinction of the scientists who have been forced out of Germany. When a man without English hospital connexions secures within a year or two a practice that appears as large as those of many consultants long known and much esteemed, it is only natural that his hosts (and competitors) should wonder whether his success is wholly based on merit. To speak plainly, the prosperity so speedily attained by some refugees has done more than anything else to weaken the desire to help refugees as a class. The alternative to such help, however, is a further degradation of English tradition. Already our former reputation for generosity to those who are in trouble because of conscience or race has passed to the French; for France (with less general unemployment) has maintained herself as the sanctuary of Europe. Before abandoning what remains of the toleration our forefathers showed, let us at least be sure that something tangible is gained.

Overcrowding—or wrong distribution? Overproduction—or under-consumption? This is all part of the fundamental economic problem of the day. Dr. HUGH CABOT'S comment[2] on the situation in the United States seems to us equally applicable to Great Britain:—

> "The question of whether or not there are too many physicians depends entirely upon our decision as to what we propose to do about providing medical care for those who do not now receive it. It also depends upon whether a more adequate distribution of physicians is to be attained. That there is work which could be done to great advantage by all of the physicians now licensed in this country seems to me perfectly clear. That they are not well employed, and that their incomes are insufficient, do not seem to me conclusive arguments for restriction of numbers."

At present the number of students seeking to enter the profession each year depends largely on its reputation as a means of livelihood compared with other occupations. That reputation may be too high; the public may be deceived into thinking

[1] Wright, S., *Lancet*, April 9th, 1938, p. 865.

[2] Cabot, Hugh The Doctor's Bill, New York, 1935, p. 260.

that medical practice is more remunerative than it really is for the average practitioner. The remedy for this is better information, both about the present and about the future, and in a useful paper on Demand and Supply in the Learned Professions Prof. W. M. KOTSCHNIG,[3] an American educationist, recommends the appointment of commissions that would keep the public in touch with the facts and would try to foretell the medical needs of the nation a few years hence. Such "planning commissions" would have to contain not only doctors but experts in economics and government, as well as social workers and other representatives of the public. KOTSCHNIG does not propose that their decisions should be the basis of limitation by governments, as already enforced in some countries, but merely that they should provide parents and guardians with sound information about prospects of employment, not only in the medical profession but in alternative occupations. He rightly thinks it important that the profession itself should not take the responsibility of keeping down the number of new entrants; for, as CABOT says, it would be unwise to imitate the behaviour of the old guilds which he accuses of being primarily concerned with the maintenance of high privileges and remuneration. But though the interests of the public must always be the first consideration, this in itself means that the doctor must be safeguarded wherever possible against disaster; for lack of work and money must sooner or later lead to lowering of standards. Anyone who goes through a long and expensive course of instruction, which is of little commercial value if he leaves medicine, should have at least a good prospect of securing work when he is qualified. In relation to general education the same kind of argument is now being put forward by Prof. J. B. CONANT, the president of Harvard, who believes that the total of university students in the United States needs reduction.[3] KOTSCHNIG will not be alone in deprecating any tendency towards what he calls "general intellectual Malthusianism," but we shall all agree that it is a mistake to give boys and girls a genuinely vocational training unless one can later offer them the appropriate work. The more elaborate and specialised the training, the more is this important. It would be wrong, however, to suppose that medicine is the only pursuit to which such rules apply. If there is a risk of over-production of personnel in this country, it affects architects, engineers, coal-miners, and a great many other specialists, more than it affects doctors. "Over-production" runs through all the social strata, and during the next trade depression one can imagine one of KOTSCHNIG's planning commissions issuing the statement that *all* the known occupations of mankind (except nursing and domestic service) are overfilled. What should we do then? Reduce the birth-rate? That might be an unnecessarily remote means of improving a world in which one cannot walk ten yards without seeing work that badly needs doing.

[3] Kotschnig, W. M., *J. Amer. med. Ass.* March 26th, 1938, p. 941.

VULVO-VAGINITIS

THIS week we publish in abridged form the conclusions reached by a committee of the London County Council on vulvo-vaginitis in children and also those based on Mrs. MARGARET RORKE's long personal experience as director of the Marlborough clinic at the Royal Free Hospital and in practice. The main points emerging are: (1) the comparatively small proportion of cases which are gonococcal in origin—and incidentally the small proportion of these which are due to direct infection by assault; (2) the comparatively non-infective character of the infections due to organisms other than the gonococcus; (3) the importance of general and medicinal as opposed to local methods of treatment. The L.C.C. report deals with a period before the value of preparations of the sulphanilamide group could be assessed but when it was already perceived, and Mrs. RORKE leaves no doubt of the dramatic effect of this group of drugs. It is of interest that œstrin by the mouth changes beneficially the character of purulent vaginal discharge by stimulating a change of the vaginal mucous membrane towards the adult resistant type, but does not affect the associated urethral (very common) and rectal (less common) inflammation. The criteria of cure suggested by the committee—negative tests for *four* months after cessation of all treatment—are even more rigid than those insisted on by Mrs. RORKE. They recognise, however, that long-continued observation tends to perpetuate anxiety in those responsible for the child, to keep up bad habits if they exist, and to fix in the memory an unfortunate experience and propose that when all is well six months after cessation of treatment such observations should cease. The details given for collecting material for bacterial diagnosis, for the conduct of laboratory tests, and for general and local routine treatment, including precautions to be taken by nurses, will be invaluable to those whose experience of these troublesome infections is so limited that their incidence seems even more of a calamity than it need prove to be. Hints that the organisation of games, singing, and lessons prevent the dangers associated with idle hands should not be lost; the minutiæ—as that Playfair probes "should be *carefully* and *evenly* dressed . . . with the best quality cotton-wool," eliminating the irregularities of substance and friability of the cheap short-fibred wool—are all based on practical experience. The fact emerges, too, that over-treatment is responsible for keeping up or even increasing a vaginitis. A practical difficulty in completing the rehabilitation of patients, especially the rare persistent or chronic relapsing ones, is to find accommodation during their recovery, since convalescent homes hardly welcome children with a recent history of vulvo-vaginitis from whatever cause. It is reassuring to learn that however persistent the discharge, or wearisome the relapses, there seems to be no direct evidence of gonococcal vaginitis contracted in childhood lasting into adult life.

"ECONOMIC SECURITY AND WELL-BEING"

PROPOSALS for the extension of old-age pensions and national health insurance are made in a pamphlet[1] prepared by five members of the National Labour Organisation, one of whom, Sir JOHN WORTHINGTON, is a medical man and deputy chairman of the organisation. They are offered as "a notable and welcome advance in the economic security and well-being of the nation." The signatories hold that the pensions insurance scheme has two serious defects. First, the pension is inadequate for persons dependent on it for support; the authors estimate that over 50 per cent. of the pensioners are either a burden on wage-earning relations or dependent on public or private charity. Secondly, the pension is often superfluous, since many men and some women pensioners are earning full wages; it is estimated that such pensioners number over 400,000, and that the number is increasing with the increased demand for labour. The authors propose that from 1943 the weekly pension should be raised from 10*s*. to 20*s*. for insured men, and from 10*s*. to 15*s*. for insured spinsters, and that the wife of an insured man should receive her pension of 10*s*. at age 60 instead of 65. The increased cost would, they estimate, be met by an additional weekly contribution, beginning in 1938, of 4*d*., to be shared equally by employers and employed, and an Exchequer grant equivalent to 2*d*. for each contribution paid. From 1943 the pensions would not be payable without a declaration of retirement from wage-earning. The retired pensioner would not be forbidden to work on his own account or to do occasional odd jobs, but he would be required not "to re-enter wage-earning employment in excess of (say) one week in any period of four weeks." The authors make this proposal because they believe that a higher pension involving retirement "would mean more jobs for the unemployed men and women in the prime of life." They state that wage-earning pensioners are criticised by their fellow-workers, and that for this reason some wage-earners do not claim pensions to which they are entitled.

It is also proposed that medical benefit should be extended to the dependants of insured persons —i.e., one adult dependant and dependent children not over school age. This, it is estimated, would add 15 million dependants to the 18 million insured persons in Great Britain, and would increase the annual cost of the health insurance scheme by £7 million, equivalent to an extra weekly contribution of 2*d*., to be shared equally by the insured persons and the Exchequer. This estimate is based on the assumption that the insurance doctors would accept a capitation fee of 6*s*. for the dependants, and that 2*s*. 10½*d*. would cover the cost of drugs, mileage, and administration, these being the amounts recommended by the departmental committee on Scottish Health Services. The authors think a 6*s*. capitation fee for dependants would "build up a considerably larger fund for the doctors than any income which they now derive from this class." The final proposal is that voluntary insurance should be extended to small traders and salaried workers earning not more than £400, and to their dependants. The changes proposed would be costly, involving an increase of 3*d*. in the weekly contribution of the insured persons, and it may be contended that the money required for the health insurance extensions could more profitably be spent in developing the preventive work of the local authorities—e.g., in the provision of many more nursery schools and other maternity and child welfare agencies. It is doubtful too whether the compulsory retirement of pensioners from work would be administratively practicable, or can be regarded as a sound method of dealing with unemployment. But the proposals are evidently the result of much thought, and merit careful consideration.

[1] Proposals for the Extension of Old Age Pensions and National Health Insurance. London: P. S. King and Son. Pp. 19. 6*d*.

EXPERIMENTAL ANILINE CANCER OF THE BLADDER

ANILINE cancer of the bladder has at last been reproduced experimentally. This has been achieved by HUEPER, WILEY, WOLFE, and others[1] mainly by the use of the right animal and very large doses of the test substance, and their success is the more creditable in that it follows a number of attempts all of which have failed to achieve their object.

When six years ago BERENBLUM[2] reviewed the whole subject of aniline cancer of the bladder, he drew attention to the disappointing results of all attempts to get more knowledge of the ætiology of the condition, by methods other than statistical compilations, or to discover the mode of ingestion of the carcinogenic substance, of the path through which it acts on the bladder mucosa, and of its chemical nature when it gets there. According to figures compiled by BERENBLUM the most suspected chemicals in the dye industry are benzidine, aniline, and naphthylamine. HUEPER and his colleagues chose to test beta-naphthylamine and used mongrel female dogs of sufficient size to allow the passage of a cystoscope, so that direct observations could be made on the bladder before and during treatment. Thirteen dogs out of sixteen developed papillomas and carcinomas in a period of 20 to 26 months, by combined oral feeding and subcutaneous injection. This latent period of about 2 years, or one-sixth of the normal life span of a dog, corresponds fairly well with the latent period of 7–10 years for carcinogenic agents acting on man. The proportion of lesions to animals exposed to the agent is greater than occurs in industrial conditions in man, but the dosage was probably immensely greater. Whether beta-naphthylamine or an impurity associated with it, or a urinary metabolite, is the actual carcinogenic chemical, has not yet been determined but

[1] Hueper, W. C., Wiley, F. H., and Wolfe, H. D., *J. industr. Hyg.* 1938, **20**, 46.
[2] Berenblum, I., *Cancer Rev.* 1932, **7**, 337.

the means to identify it are now at hand. The method of entry into the human subject, now believed to be by inhalation, is also still to seek. The authors are under the impression that the massive oral doses given to the dogs in the last year of the experimental period were mainly responsible for their results. To the controversy whether the carcinogenic chemical is carried by the blood stream to the bladder where it manifests a special affinity, or whether it is excreted in the urine and acts on the bladder mucosa because it is in contact with that part of the urinary tract longer than any other, HUEPER and his colleagues have contributed some most pertinent comment. They hold the latter theory, for various reasons including the correspondence between the site of the lesions in man and dogs. In man they occur in the lower half of the bladder especially in the trigonal region; in dogs they are found in the most dependent part of the organ, that is the anterior wall and distal portions of the lateral and posterior walls when the animal is lying down. These are the sites in each case where urine remains longest in contact with the epithelium. During the course of this experiment material for biopsy was removed at intervals and the histology of this material is described as well as that of the fully developed papillomas and carcinomas. It is clear that this work puts us in a fair way to the solution of several of the problems connected with this important industrial disease and has laid the foundation for further work.

ANNOTATIONS

JAUNDICE AND JOINTS

FOR the last four or five years Dr. Philip Hench, of the Mayo Clinic, has been looking for confirmatory evidence of the observation he made in 1929 that the swelling and pain in the joints of a patient with rheumatoid arthritis subsided with the incidental development of a catarrhal jaundice and did not return in their former degree for some months. He now [1] has 28 examples of this phenomenon in rheumatoid arthritis and 12 in patients with peri-articular fibrositis. The jaundice was usually of the toxic or infective variety, attributable either to cincophen or to an unknown infection, but in two instances was due to obstruction by stone. The relief of pain and stiffness due to active inflammatory change in joints is often described as prompt and dramatic, and sometimes caused the patients much surprise; several of them, after their jaundice had recovered and their arthritis relapsed, longed again to exchange the latter for the former. A series of 13 cases of joint disease of various kinds, in which jaundice occurred without relieving pain, serves as a partial control, and suggests that a moderately severe rather than a mild jaundice is necessary to produce the effect on rheumatoid arthritis, while even a severe jaundice is without effect on gout. The phenomenon is therefore thought to be more than a mere analgesic relief of pain, especially since tenderness, muscular spasm, and even swelling of joints were also diminished. There seems little doubt, from the case records and spontaneous accounts given by patients, that the relation between jaundice and joint symptoms was something more than fortuitous. It is obviously desirable that the sequence of events should be watched for by others and when observed carefully reported; and it was certainly worth investigating it experimentally, as Drs. H. E. Thompson and B. L. Wyatt [2] in another part of America proceeded to do. After observing themselves several examples of jaundice-evoked remissions, they tried giving rheumatoid arthritic patients injections of bile salts and of bilirubin. Neither decholin sodium (2 g. daily intravenously) nor bilirubin (10–15 mg. per kg. daily intravenously) had any effect on the arthritic symptoms, although the latter sufficed to produce slight jaundice. But when both bile salt and bilirubin were given together, daily for about ten days, an amelioration was observed. Ten patients so treated all experienced relief of pain and diminution of swelling sooner or later in the period of treatment, and the remission of symptoms lasted up to three weeks. This looks like confirmation of Hench's thesis, although he himself, in his first attempts to repeat Thompson and Wyatt's work, failed to obtain similar results; the discrepancy was attributed to technical errors in the preparation of the bilirubin-bile-salt infusions. No doubt more will be heard of Hench's phenomenon, from both clinical and experimental aspects. It is to be hoped that no rash attempts will be made to treat rheumatoid arthritis blindly by some form of induced jaundice, but that the clue here offered may lead to a clearer understanding of the mechanism of the joint changes, on which in turn a rational if still only symptomatic treatment may be based.

Dr. Hench described his work at the third session of the Bath congress, and a report of his communication appeared in our issue of April 9th (p. 859).

[1] *Arch. intern. Med.* March, 1938, p. 451.
[2] *Ibid.* p. 481.

THE OBSTETRIC BINDER

BINDERS for babies have been the subject of heated argument; binders for mothers seem to have aroused comparatively little excitement. It has long been the custom to introduce a pad under the abdominal bandage after the removal of a large ovarian cyst; yet although the tumour removed from the abdomen during the second stage of labour is considerably larger than most cysts, it is often not considered necessary to bind the abdomen at all. A revival of interest in the benefits obtained from moderate external pressure after delivery followed the choice by Prof. Miles Phillips of the rational use of the obstetric binder as the subject of the Joseph Price oration to the American Association of Obstetricians, Gynecologists, and Abdominal Surgeons in September 1936,[1] and reference is made to this address not only in the eighth edition of Eden and Holland's Manual of Obstetrics, published last year, but in Mr. G. F. Gibberd's new short text-book.[2]

Since the middle of the seventeenth century many authors have referred to the binder, and have advised its use for a variety of purposes, with the result that it has wandered up and down the trunk from the mammæ to the great trochanters, and has been made from anything from the skin of a black sheep, slaughtered in the lying-in chamber, to more

[1] Transactions of the American Association of Obstetricians, Gynecologists, and Abdominal Surgeons for 1936, pp. 14–28.
[2] A Short Textbook of Midwifery. By G. F. Gibberd, M.B., M.S., F.R.C.S., M.C.O.G. London: J. and A. Churchill. 1938. Pp. 529. 15s.

ordinary materials. To William Smellie belongs the credit of first applying the binder in the right place, at the right time, and for the right purpose. In 1752 Smellie realised that the emptying of the distended abdomen might be accompanied by collapse, and that this was due to the rush of blood to the relaxed vessels of the abdominal contents. "The pressure being thus suddenly removed, the head is all at once robbed of its proportion of blood, and the immediate revulsion precipitates the patient into dangerous lypothymia." He therefore used, after delivery, a skirt with a broad head-band which was pinned firmly over a pad to compress the viscera and the relaxed parietes. He went so far as to order an assistant to compress the belly until the binder was in position. Prof. Phillips had records made as a routine for seven years of the blood pressure before, during, and after labour, and was struck with the frequency of a pronounced fall even in normal cases. He found that compression of the upper abdomen might be followed by an increase in the systolic pressure of 10 mm. Hg. His practice is to apply a binder 7 in. wide to the abdomen above the empty uterus with a folded towel underneath. Admittedly this procedure is mostly unnecessary, but it can do no harm. Every obstetrician sooner or later meets a case of extreme shock following normal or, particularly, abnormally rapid labour. Every year a number of women lose their lives from this cause alone. It would certainly be worth trying to reduce the number of these deaths by the routine use of a small binder. Such a binder need not be uncomfortable. It does not conceal the uterus because it does not come below the umbilicus, and it can be removed after twenty-four hours when its work will be done.

CAPILLARY BLOOD FLOW

THE question as to whether human capillaries possess a local occlusive mechanism, not dependent upon general circulatory conditions, has long been debated. The Rouget cells which are alleged to be responsible for capillary contraction in the frog have not been demonstrated in man, and although their absence does not necessarily imply a lack of focal contractility, it does suggest that different conditions govern capillary activity. The theory of spontaneous intermittent activity of individual capillaries put forward by A. Krogh in 1922 was rejected in 1926 by Sir Thomas Lewis, so far as the capillaries of the human skin are concerned.[1] Lewis's conclusions were based chiefly on observations of the vessels of the skin of the back of the hand, a region where the capillaries are visible only with some difficulty. According to Bordley et al.[2] the skin over the tibia affords a better site for the study of cutaneous capillaries, partly because in this situation the skin is relatively transparent, and partly because the plane of many of the capillary loops subtends a very small angle to the surface of the skin, so that the vessels here pursue a reasonably long course more or less parallel to the surface. Under these conditions of optimum visibility, Bordley and his co-workers have observed frequent and long interruptions in capillary blood flow. The pauses in neighbouring capillaries are not simultaneous; the flow in one capillary may continue unabated, while that in an adjacent capillary, arising from the same arteriole, may be interrupted many times. These characteristic and independent intermissions of flow continue to occur without material alteration when the venous pressure is raised by means of a pneumatic cuff round the limb. The intermissions in capillary circulation are therefore not due to variations in any passive resistance, but to some active local reaction which is even able to overcome a moderately raised resistance. When the blood flow in a capillary stops, the arterial end of the vessel is generally empty, even in the presence of an increased venous pressure. It seems that the capillary is occluded by some mechanism not far from the arterio-capillary junction. Sometimes a capillary seems to be occluded at several points along its course. The capillary wall itself is invisible under the conditions of the experiments, and Bordley and his associates are not able to offer any clue as to whether the cessation of blood flow is brought about by the contraction of Rouget cells or by the swelling of endothelial cells. They conclude that the observations indicate that the capillaries are endowed with an occlusive mechanism which may prevent the passage of blood through their lumina. In the light of the observations of E. R. Clark and E. L. Clark[3] this conclusion does not appear entirely justifiable. By using a transparent chamber in the rabbit's ear the Clarks were able to see the capillary wall, and frequently observed the changes described by Bordley without ever seeing alteration in the diameter of the capillary lumen itself. They concluded that there is no evidence that mammalian capillaries in normal circumstances contract independently. This question is not yet settled, since H. K. Beecher,[4] whom Bordley quotes, using the Clarks's technique in Krogh's laboratory, observed contraction of the capillaries in normal circumstances.

The difference between the observations of Lewis and those of Bordley may arise from the fact that they observed different areas of skin. The skin of the hand, observed by Lewis, plays a rôle in the dissipation of body heat, and at the higher temperatures at which Lewis observed it might reasonably be expected to display vessels wide open to favour the transfer of heat. In the skin which Bordley examined the minute blood-vessels are of less importance in heat regulation and might open and close in response to local tissue needs.

THE OBSESSIONAL PATIENT

IT is impossible to investigate a special problem of psychopathology without being forced back to general problems of normal mental life. A penetrating study of the psychopathology of obsessions[5] by Dr. Erwin Straus illustrates this. Beginning with the horror of death shown by a severely obsessional patient, he refers this very characteristic symptom to the disgust which decay universally arouses, and he examines how far the quality of being in decay (*das Verwesende*) is a necessary or accidental (in the Aristotelian sense of the word) manifest or hidden attribute of the object which arouses disgust. It is, he concludes, accidental and hidden. In elucidating this he discusses the inconstant part played by the object in determining the emotional aspect of the perceptual process, and the pathology of those "sympathetic relationships" to which he would refer obsessional phenomena, and which he regards as the link between obsessions and schizophrenia, just as the link with melancholia lies in the incapacity to treat the past as done with. On the time-disturbance he writes with brevity but much authority

[1] Lewis, T., *Heart*, 1926, **13**, 1.
[2] Bordley, J., Grow, M. H., and Sherman, W. B., *Bull. Johns Hopk. Hosp.* January, 1938, p. 1.
[3] Clark, E. R., and Clark, E. L., *Amer. J. Anat.* 1935, **57**, 385.
[4] Beecher, H. K., *Skand. Arch. Physiol.* 1936, **73**, 1.
[5] *Mschr. Psychiat. Neurol.* 1938, **98**, 61.

in view of his well-known studies of *Zeiterlebnis* in other mental anomalies. The obsessional patient, according to Straus, lives in a peculiar world, permeated by decay; a world fundamentally different from that of the normal man. Straus will not concede any analogy, much less essential identity, between such a normal experience as the familiar "having a tune run through one's head" and genuine obsessional symptoms. He holds that the heredity, course, and resistiveness to psychotherapy of the obsessional illness puts it among the endogenous psychoses, and —in opposition to the Freudian interpretation—that the obsessional patient is incapable of changing his total conduct under the influence of psychological treatment. Straus recognises how similar the greed, excessive precision, uncertainty, and other features of the obsessional appear to these proclivities in the normal, but believes there is an essential difference none the less, consisting in the lack of composure, of ability to cope with the necessary inconclusiveness of all behaviour, which makes the obsessional patient prefer ordered plans to changing events and decisions, and makes him wish to reverse what has already happened. He wants to substitute certainty where only an opinion is possible; wants an impersonal scheme wherewith to meet personal responsibilities. Of that incessant doubt which has given the condition one of its names, Straus believes that it occurs, especially in its form of vain searching for ultimate causes, because the patient is debarred from feeling in communion with his world (as religion or tradition might otherwise make him), and from resignedly or complacently letting things go—attitudes which sustain healthy people in a world of vicissitudes, of provisional or hidden events. The ceremonial of which the obsessional makes use to defend himself against a world full of decay is; anthropologically regarded, of a piece with primitive magic.

THE OLD ASHMOLEAN MUSEUM

THANKS to the generosity of the Friends of the Old Ashmolean it has now become possible to complete the series of armorial windows on the main staircase of the Old Ashmolean building at Oxford which, it has been decreed by the University, will wholly return to its original use as a scientific institution. In the presentation of the last window, which is expected to be ready for fixing by the end of May, the Royal College of Physicians of London have taken an important part, and their armorial bearings which figure in the window will serve as an enduring reminder of the intimate connexion of the Old Ashmolean with prominent members of the medical profession. In his opening address to the recent International Congress on Rheumatism and Hydrology, Sir Farquhar Buzzard described the part played by many Oxford men in promoting the study of hydrology. After alluding to Dr. Walter Bailey in pre-Ashmolean days, he reminded the congress of the work of Dr. Plot, the first keeper of the Old Ashmolean, on mineral springs; of Dr. Wall, the founder of Malvern Spa; of Dr. Daubeny who, studying the chemical composition of the more important springs in the Ashmolean laboratory, became the greatest authority on mineral waters of his day. Hydrologists are properly desirous that the evidence for Dr. Daubeny's results should not be lost, that the apparatus used by him in the 'twenties and 'thirties of last century should be preserved, and in preference in the building in which his researches were carried out, for his laboratory notebooks are still in existence. The collections in the Old Ashmolean include a large number of medical and especially of surgical interest, but space and funds for their adequate display are alike wanting. Since the original appeal was made by Lord Halifax the principle has been adopted of permitting benefactors to earmark their gifts for particular institutions in the University. Thus the geological department has received £25,000 from the Shell Oil Companies, the Ashmolean museum of art has received £10,000 from the Drapers' Company, and the department of physics is promised £60,000 from another source. Meanwhile the sums specially allocated to the museum of the history of science, where a special feature is being made of illustrating the work of Oxford men, are inconsiderable in view of the value of the results that may be obtained. Few universities have had a more honourable connexion in the past with the art and science of medicine; none may have a more promising connexion with clinical studies in the future, if the ideals of the great Nuffield foundation are achieved. It should not be difficult to raise the capital which is still required to staff the Old Ashmolean and cover its working expenses.

ENDOWMENT WITH DISCRETION

IN addition to its full annual report and that of its International Health Division, the Rockefeller Foundation publishes each year a less formal review of its work by its president. Last May Mr. John D. Rockefeller, the founder of the foundation, died at the age of ninety-eight, and Mr. Fosdick takes this opportunity [1] to describe the principles which guided him in the distribution of some 530 million dollars for philanthropic purposes. In the first place Rockefeller did not think that benevolence and wisdom were confined to his generation, and that what seems important to-day will necessarily seem important to-morrow. He would have agreed with Sir Arthur Hobhouse's comment on mediæval foundations that "a nation cannot endure for long the spectacle of large masses of property settled to unalterable uses." As a result, when the foundation was incorporated, the sole purpose stated in its charter was "to promote the well-being of mankind throughout the world," and in 1920 Rockefeller wrote to his trustees revoking any restrictions or limitations which he had made as to specific purposes for which his funds were to be used. This has led the trustees to give the recipients of endowment funds wide discretion in the uses to which they may put them. In the second place Rockefeller did not believe that it was wise to attempt to maintain foundations in perpetuity. "Perpetuity is a pretty long time," he remarked. He therefore authorised his trustees to spend principal as well as income, and the foundation has already spent 87 million dollars of its principal fund. In making endowments the foundation allows the recipients to spend 5 per cent. of the principal each year after the fifth, and to use the whole of the principal at the end of twenty-five years for some purpose reasonably related to the original intention, "having regard to intervening changing conditions." These liberalising provisions represent an attempt to free the future from frozen funds and tired endowments.

In the past the foundation has aimed at carrying out its work on an international plane without considering political boundaries or doctrines, but in recent years this ideal has encountered increasing difficulties. Some fields have had to be abandoned

[1] The Rockefeller Foundation: A Review for 1937. By Raymond B. Fosdick. Pp. 62.

not because the frontiers have any greater significance than they had a few years ago but because behind them the search for truth has been made impossible. The foundation's work in China has been virtually destroyed in the last six months. It was mostly centred in such institutions as Nankai University in Tientsin, and the University and Agricultural Research Bureau at Nanking. Nankai University was completely destroyed last July, and the institutions in Nanking, where they are not too badly damaged, are serving to-day as army barracks. In addition the field units dealing with education and public health are so completely scattered that it is impossible to locate them. It was no doubt the possibility of such eventualities as these that led Rockefeller to avoid tying his benefactions to rigid and unchangeable purposes.

PNEUMOCONIOSIS AND PULMONARY CANCER

EVIDENCE of association between various irritating substances and primary cancer of the lung has long been sought. In the Schaleberg miners there is a relatively high incidence of both pneumoconiosis and of tumours of the lung and bronchus, but here, and in the Joachimsthal uranium mines, environmental conditions are peculiar and the association cannot be securely held to be evidence of a common origin. In other places various workers have noted from time to time the presence of pulmonary carcinoma in persons suffering from silicosis, but there is no evidence in such data that the incidence of carcinoma is greater than in the general population unexposed to a silica risk. C. S. Anderson and J. H. Dible have attempted to test that point by examining post-mortem material.[1] They sought to ascertain whether, in fact, the lungs of persons dying of a primary carcinoma of the lung have a higher silica content than the lungs of persons dying of other causes. To answer the question they carried out silica estimations upon the whole lung, each being estimated separately, in fifty subjects without cancer of the lung and seventy subjects dying of a primary cancer of the lung. The former group was held to represent "the general run of post-mortem material from two general hospitals in Liverpool"; the latter included nearly all the deaths from primary lung cancers in the same hospitals. The comparative results are suggestive. In the non-carcinomatous lungs the mean silica content (i.e., total silica in grammes) was 0·14 for the right lung, 0·12 for the left, 0·26 for both lungs. The corresponding figures for the carcinomatous lungs were substantially higher—namely, 0·34 for the right lung, 0·26 for the left, and 0·60 for both lungs. This excess was entirely due, however, to the silica content in twelve out of the seventy subjects; after the deduction of this group the remainder gave figures identical with those for the controls. In other words, there was, as would be expected, no evidence of a silica risk in the great majority of the persons dying from a cancer of the lung. On the other hand, roughly 1 in 6 of those persons showed a high—most of them excessively high—silica content of the lungs, and such observations were absent from the control group. Of these twelve subjects seven showed indisputable evidence of silicosis, three had an excess of silica in the lungs and a histological picture of fibrosis with the features of that set up by silica, and two an excess of silica with fibrotic changes which though not typical were compatible with a silicious origin.

These results lead the authors to conclude that in a certain group of cases of pulmonary carcinoma the rôle of the silicosis is an ætiological factor. The absence of silicosis in the control group is evidence against the association being fortuitous, and the authors add that their general post-mortem experience has also given them no evidence of a local unrecognised silicosis in persons dying of other diseases. It may be, however, that the complete absence of silicosis from the control group is attributable merely to the smallness of the number examined. Persons suffering from silicosis do not always die of that condition or from pulmonary carcinoma, and should therefore appear *sometimes* in a control group. The question at issue is really whether they appear there less often than in the carcinoma of the lung group. The authors admit that in industries in which silicosis is a recognised risk, and in which much medical supervision is given, no association with carcinoma has been observed, but their plea that this question should receive specific attention should not be ignored. It might well be the subject of a "follow-down" study into the past history of victims of primary carcinoma of the lung, on the lines suggested by W. Cramer.[2]

[1] *J. Hyg., Camb.* 1938, **38**, 185.

BRITISH ASSOCIATION MEETING AT CAMBRIDGE

THE annual meeting of the British Association will be held this year at Cambridge from August 17th to 24th, and Lord Rayleigh will deliver the presidential address on "Natural Vision and Vision Aided by Science." Subjects of addresses and discussions will include the eyes and brain as factors in visual perception, the mechanism of evolution, sense perception and the evolution of colour and pattern, and the water-supply of London. In consideration of a growing public demand the council are grouping together into a definite series those communications which have a more immediate bearing on the life of the community, and they have also authorised the publication of a review of recent progress in various departments of science (The March of Science, 1931–35, Sir Isaac Pitman, 3*s.* 6*d.*), which is to be the first of a quinquennial series. Applications for membership should be made to the office of the Association at Burlington House, Piccadilly, London, W.1.

OTTO NAEGELI

THE name of Otto Naegeli has for so long been associated with tuberculosis and hæmatology that it will come as a surprise to many that he was only 67 years old when he died last month. He came of distinguished medical stock; his father enjoyed the rare honour of begetting two sons who became professors of medicine, Otto his eldest at Zürich and Oskar his youngest who occupied the chair of dermatology at Berne. At the age of 14 Otto was so enamoured of botany that he would have liked to devote all his life to it, and though his father persuaded him to make medicine his main career, he remained at heart a botanist and published more than twenty articles on botanical subjects. Having qualified in medicine he studied under Monakow and wrote a thesis on cyclopia. Soon afterwards, working at Bonn under Ribbert, he undertook a study which has become classic—the demonstration of tuberculosis in 98 per cent. of the 500 dead bodies in which he sought evidence, however minute, of such an infection. It may be mentioned in passing that last year, in the same institute, Uehlinger and Blangey confirmed Naegeli's findings on material twice as large as his own. Naegeli was quick to grasp the import of his

[2] *Brit. med. J.* April 16th, 1938, p. 829.

findings and to maintain that the fatal issue of tuberculosis is determined not so much by the primary infection as by the disposition of the person infected. At Berne Naegeli came under Hermann Sahli's influence, and his interest in hæmatology was quickened by an epidemic of typhoid fever which enabled him to demonstrate the diagnostic and prognostic value of the differential leucocyte count and started him writing a text-book on hæmatology which was translated into many languages. In 1912 Naegeli was invited to take charge of the medical polyclinic in Tübingen, where he remained during the war, at the end of which he returned to direct the medical polyclinic at Zürich. His last work on "The Differential Diagnosis in Internal Medicine" was carried through in spite of the tuberculous spondylitis which had overtaken him and which entailed all the discomforts of plaster-of-Paris immobilisation. His many contributions to medicine were recognised by honorary degrees conferred at Edinburgh, Berne, Tübingen, Heidelberg, Geneva, and Athens.

THE INVENTOR OF RHEUMATISM

Guillaume de Baillou was a physician of Paris in the latter half of the sixteenth century, who enjoyed a great and deserved reputation in his lifetime, and whose works on medicine lived on after his death for more than a century. His other writings have long since passed to those shelves which are but rarely explored even by the learned antiquarian, but his tract on rheumatism [1] has lived on and is here presented for our delectation translated from the original Latin by Dr. Ruhmann. It has lived chiefly because Baillou was the first physician who attached the name rheumatism to a group of symptoms which constitute a disease, well known, as he says, to every capable physician, but until his time unnamed and included under the general name of "catarrh." The disease which he thus christened is certainly our acute rheumatic fever, and possibly may have included in his mind some other of the more acute arthritides—for instance gonococcal arthritis—but he draws a sharp line of distinction from gout and the more chronic bone and joint affections. His phraseology is often puzzling to us moderns, but it is clear that rheumatism shaped itself in his mind as a disorder of the blood—he compares it in one passage to a "putrid fever"; and though the doctrine of infection was still three hundred years in the future Baillou saw that the outward manifestations of the disease, the effusions into the joints, the pains, and the low fever on which he lays stress, were the result, as we should now say, of a disordered chemistry of the body fluids. Dr. Ruhmann has struggled successfully with the difficult task of translating Baillou and has added footnotes which help to make the sixteenth-century pathology intelligible to the modern reader. Like all good editors he has an unbounded admiration for his author, and concludes his parting remarks with a quotation from the Danish scientist Troels-Lund to the effect that all human development follows the same spiral path upwards and that the new ideas arrive at the same point as the old but at a higher level.

When we have made some allowance for the somewhat complicated pathology the striking feature of Baillou's tract is its accuracy of description. There is little which can be called mere verbiage, and indeed with some omissions it would still be considered a good clinical lecture. It is interesting to find that after a clear account of the signs and symptoms of the disease he adds that for a real and special knowledge the disease must be studied in the bodies of patients: an early instance of insistence on bedside study. Here and there we seem able to trace the Frenchman through the medium of two translations: "The ignorance of the physician means for the patient a second disease" is surely an epigram in the very style of Paris. On the whole the perusal of the brochure leaves one in substantial agreement with Dr. Ruhmann that we have been listening to one of the great physicians.

[1] Das Rheumabuch des Doctor Ballonius. German edition by Dr. Walter Ruhmann, Berlin. Mittenwald: Theophrastus-verlag Arthur Nemayer. Pp. 70.

UNIVERSITIES OF THE EMPIRE

THERE are now seventy universities in the British Empire, each with characteristic features of its own. Before the year 1914 anyone seeking information about the organisation or personnel of one or other of them could only find it in the official calendar which was then the only authentic source of information. The Universities Bureau which was the outcome of the 1912 congress decided to put this right by compiling a year book of which the issue for 1938 is now before us.[1] In its introductory chapters may be found the history, regulations, and practice of the universities in various parts of the Commonwealth, and each section contains a directory of the officers and members of the staff of the university. It is this information which makes the year book indispensable as a work of reference, for the name index which occupies 80 pages, each of 3 columns, is practically a complete academic record of the British nation, and its arrangement and accuracy leave nothing to be desired. Apart from the innumerable little alterations required to keep the year book up to date, the only new feature in this volume is the report of the executive council of the bureau, which shows that the statement quoted in the preface is no longer true that there was a time when university men took little interest in the affairs of any university except their own. The year book also contains a record of outstanding events which have occurred during the previous academic year.

WE regret to announce the death on April 16th of Mr. JOHN BRIGHT BANISTER, surgeon to Chelsea Hospital for Women, senior obstetric physician to Charing Cross Hospital, and consulting obstetric surgeon to Queen Charlotte's Hospital, and a member of the Central Midwives Board.

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[1] The Yearbook of the Universities of the Empire. 1938. Published for the Universities Bureau of the British Empire by G. Bell and Sons, London. Pp. 1154. 15s.

HEBERDEN LECTURESHIP AND MEDAL.—A bronze medal, known as the Heberden medal, will be awarded annually to a registered medical practitioner by the Heberden Society for the best work in the British Isles on the investigation of the rheumatic diseases. The recipient will be invited to deliver the Heberden lecture which should comprise a review of the work carried out for the award of the medal. The first award will be made in January, 1939, and the referees appointed by the society are Dr. Matthew Ray (president), Dr. C. W. Buckley, and Dr. Mervyn Gordon, F.R.S. Published work should be submitted in the first place to the secretary of the society, Dr. Kenneth Stone, 58, Chesterfield House, Chesterfield-gardens, London, W.1.

SPECIAL ARTICLES

EPIDEMIC INFLUENZA

THE new green-book on influenza[1] will appeal to clinicians as well as to laboratory workers. It is an up-to-date summary of the developments in the influenza problem which have taken place as a result of the discovery in 1933 that influenza was a virus disease and that it was transmissible to ferrets. The discovery of a susceptible animal opened up methods of investigation which had previously been unavailable and a further and unexpected aid to study was provided when it was demonstrated that the disease could be transferred from ferrets to mice by direct inoculation of virus into the respiratory tract under anæsthesia. Swine and hedgehogs were subsequently shown to be also susceptible. For a time it was believed that the virus obtained from different epidemics was immunologically the same, but it was soon shown by Magill and Francis that there is more than one serological type of virus, though it is probable that the different types are very closely related. From a study of cross-neutralisation experiments with strains of virus of various provenance, vis-à-vis their neutralising antisera, it has been shown by Magill and Francis and others that there are at least three types of the virus, though these are very closely related. Wilson Smith, Andrewes, and Stuart-Harris found that ferrets can be protected by vaccination, if not against massive intranasal installation of virus, at least against infection by ordinary contact. They moreover showed that vaccinated animals and animals recovering from the natural disease contain antiviral neutralising bodies in their sera and this also applied to human beings.

ANIMAL EXPERIMENTS

With these facts established it became urgently desirable to devise a method for immunising human beings and put it to trial. During the 1936–37 outbreak of influenza this experiment was undertaken. The vaccine used consisted of filtered preparations of the lungs of infected mice in which the virus was killed with chloroform. Formolysed vaccines, prepared from cultures in chicken-embryo medium, were also tried. During 1936 and 1937 the vaccines were tested on groups of several hundred human volunteers, mostly young soldiers. In each case the virus was shown to be concerned in the outbreak and adequate uninoculated controls were included in the observations.

Unfortunately no conclusive evidence was obtained of the efficacy of vaccination. The fact that a few of the volunteers contracted to typical influenza, of proven virus ætiology more than 14 days after their vaccination, was disappointing. Possibly the failure of the method was due to the unavoidable premature exposure of the vaccinated men to infection; another possible reason is that at the time of the experiment the existence of more than one serological type of virus was not appreciated. In further experiments it will be desirable to use polyvalent vaccines and to work out the serological relationships of the virus used in the vaccine to the virus isolated from the epidemic against which the vaccine is being tried out.

WHAT IS INFLUENZA?

In addition to the interesting experimental work recorded the report contains a valuable clinical and epidemiological study of the 1936–37 epidemic by Dr. Stuart-Harris in which the natural history of the disease is reviewed, at first hand, in the light of the recent experimental findings. The study of influenza is entering a phase already illustrated by dog distemper, where the immediate result of ætiological discovery has been to show that what was previously classified as a single disease, in reality consists of a number of clinically and epidemiologically separable entities. At this stage in an ætiological investigation clinical and experimental observers should keep very closely in touch with each other. The central clinical question of influenza—"what is influenza and how may the individual case be diagnosed?"—has not been answered, but unquestionably the knowledge that there is a virus influenza—an *influenza vera*—has added definition to the problem even if it has not yet provided a solution. Dr. Stuart-Harris's observations show that influenza-like conditions exist which are almost certainly of a different ætiology from the typical virus disease. He gives these epidemics from which no virus could be isolated the name of "febrile catarrhs." Epidemics of these "febrile catarrhs" may be quite extensive, but it seems probable that the larger epidemics and pandemics of influenza will prove to be the virus disease.

DIFFERENTIAL DIAGNOSIS

Dr. Stuart-Harris makes some interesting observations on differential diagnosis.

The outstanding characters of the *virus disease* are its sudden onset with constitutional symptoms followed later by coryza, sore-throat, and cough. The fever rises rapidly on the second day and may or may not be followed by a remission on the third day, but there is usually a renewed pyrexia on the fourth day (diphasic temperature). The typical facies is heavy and drowsy with drooping eyelids, glistening eyes, dusky facial flush, and slightly cyanosed lips. Bronchiolitis is a common later complication.

In the "*febrile catarrhs*," at least those forms observed by Dr. Stuart-Harris, the onset is insidious, and respiratory symptoms or angina are early. The general symptoms are inclined to be overshadowed by the local symptoms in the respiratory tract. The fever has no characteristic course and shows no special tendency to be diphasic in type. The general aspect is that of a patient with a heavy cold.

The report also contains an account by Mr. D. L. Hughes of an inquiry as to the diagnostic value of blood counts in influenza. No evidence was obtained that either the total or the differential blood count has any diagnostic peculiarity.

A study of a limited number of cases of pneumonia during influenza epidemics suggested that there is a form of true influenzal pneumonia, associated with the presence of the virus in the lungs though sometimes assisted by secondary infections with bacteria. In this, too, the older surmise of clinicians has been confirmed.

SERUM THERAPY

In 1935 Laidlaw, Wilson Smith, Andrewes, and Dunkin described the use of an antiviral horse serum in the treatment of mice experimentally infected with influenza virus. The present report describes some observations as to the therapeutic use of antiviral serum in the treatment of human influenza. In all nine patients were thus treated, some of them suffering from severe influenza. It is interesting to note that all the more severely affected patients seemed to get

[1] A Study of Epidemic Influenza with Special Reference to the 1936–7 Epidemic. By C. H. Stuart-Harris, C. H. Andrewes, and Wilson Smith, with D. K. M. Chalmers, E. G. H. Cowen, and D. L. Hughes. *Spec. Rep. Ser. med. Res. Coun., Lond.* No. 228. London: H.M. Stationery Office. 1938. Pp. 151. 2s. 6d.

better temporarily after the injection of serum, but taking the results as a whole it was impossible to show that serum treatment had any unquestionable beneficial effect on the course of the disease. The fact that these initial experiments in both vaccine prophylaxis and serum therapy have been in a measure disappointing gives no grounds for pessimism at this stage. It is quite obvious that in coping with influenza we are only at the beginning of things. Not the least promising line of investigation is that arising from the successful cultivation of the virus in media containing chick-embryo tissue. Recent work by Francis and Magill and also by Hyde and Chapman indicates the possibility that the virus can be isolated from man by employing mice and chicken embryos in place of ferrets, and if this technique proves successful one of the major difficulties in the laboratory diagnosis of the disease will be removed.

VULVO-VAGINITIS IN CHILDREN

(Extracted from a report of a Departmental Committee appointed by Sir FREDERICK MENZIES, *Medical Officer of Health to the County of London*[1])

THE well-known fact that bacterial infection of the genital tract usually begins in the cervix in adults and in the vagina in children depends upon certain interrelated anatomical and physiological differences in the genital tract before and after puberty.[2] In the fœtus and new-born child the vagina is lined by thick many-layered stratified squamous epithelium. In the infant of three to four weeks the epithelium is much less thick, and by two to three months it has become quite thin and remains so until puberty, when it changes abruptly to the florid many-layered type. Glycogen is abundant in the epithelium of the new-born infant and the maiden, but absent or scanty in that of the child. Its presence in the vagina fosters bacterial fermentation, and Döderlein's bacillus, which is able both to ferment glycogen and to resist the high degree of acidity (*p*H 4·0 to 4·4) which ensues, becomes the predominant and usually sole survivor. Thus in the infant for two to three weeks after birth and in the adolescent girl there is a thick smooth vaginal epithelium accompanied by a fair amount of highly acid vaginal "secretion"—factors which inhibit bacterial invasion. Between these two periods the thin vaginal epithelium becomes rugated and cryptic while the absence of fermentable glycogen results in a slightly alkaline, very scanty secretion, so that bacterial infection is facilitated.

These changes almost certainly depend on the presence of the œstrogenic hormone in the circulation. Œstrin is abundant in the new-born child and presumably the fœtus, being derived from the maternal circulation via the placenta, but after the first week it cannot be demonstrated in the urine and remains absent until puberty, when pituitary stimulation causes it to be produced by the child's ovaries. By administration of œstrin the vaginal mucous membrane of the child may be converted from the thin susceptible to the adult resistant type, and this is the basis of œstrin therapy in vulvo-vaginitis.

Classification

The term "vulvo-vaginitis" includes a variety of conditions varying greatly in their clinical manifestations, their causal organism, infectivity, and the readiness with which they yield to treatment. A vaginal discharge is characteristic, but frequently there are only soreness and irritation of the vulva with reddening and perhaps œdema of the vulva and introitus. Frequency of micturition is common and the inguinal glands may be enlarged. For practical purposes it is best to classify the cases as gonococcal or non-gonococcal, since "gonococcal vulvo-vaginitis" is a recognised clinical entity with peculiar problems of its own.

In the last two years a very careful watch for this disease has been maintained among the many thousands of sick and healthy children at the hospitals, residential schools, and nurseries of the London County Council, and during this period there have been 627 cases of vulvo-vaginitis, of which 32 were gonococcal. In a series of 1219 cases at the Hospital for Sick Children, Great Ormond-street, Dr. Nabarro classed 249 cases as gonococcal, 949 as definitely non-gonococcal, and 21 as doubtful, and of 955 cases seen at out-patients between 1930 and 1936, 117 were classed as gonococcal and 838 as non-gonococcal. These series were to a certain extent selected. The Council's proportions of positives was too low because known gonococcal cases are diverted at once to St. Margaret's Hospital, whereas the figures at Great Ormond-street were too high as the hospital has a V.D. clinic to which known cases are naturally sent from other hospitals and child welfare centres. The fact emerges, however, that vulvo-vaginitis is only in a small minority of cases gonococcal, a point which is perhaps not widely appreciated.

No useful purpose is served by emphasising the causal organisms to parents and the public generally. Vulvo-vaginitis in children is only very rarely a venereal disease, and it is really an accident whether the cause is a gonococcus, a streptococcus, a colon bacillus, or any other organism.

Gonococcal Vulvo-vaginitis

This disease causes the gravest anxiety to all responsible for the health of children owing to its great infectivity, resistance to treatment, and the horror it excites in the public mind. Its incidence is very difficult to gauge as it is, of course, not notifiable and there is every motive against publicity when outbreaks occur. The number of cases in children under 14 coming under hospital or clinic treatment in London in 1936 may be estimated as follows:—

St. Margaret's Hospital	32
Hospital for Sick Children, Great Ormond-street	24
London Lock Hospital	14
Children's Medical Home, Waddon	44
V.D. clinics under Public Health Scheme	34
	148

This list inevitably excludes cases treated in private but it does include an unknown number from the Home Counties.

ÆTIOLOGY

Infection is usually the result of contamination of the vulva with such infected fomites as towel,

[1] The members of the committee were: Dr. P. J. WATKIN, medical superintendent, Lambeth L.C.C. Hospital (chairman); Dr. D. KATHLEEN BROWN, medical officer in charge of the V.D. department, South London Hospital for Women; Lieut.-Colonel E. T. BURKE, director, Whitechapel Clinic; Dr. R. CRUICKSHANK, pathologist, group laboratory, North-Western L.C.C. Hospital; Dr. LETITIA D. FAIRFIELD, senior medical officer, London County Council; Dr. G. W. GOODHART, pathologist, group laboratory, St. Mary Abbots L.C.C. Hospital; Dr. R. LIGHTWOOD, assistant physician for children, Westminster Hospital; Dr. D. N. NABARRO, director, pathological department, Hospital for Sick Children, Great Ormond-street; Miss GLADYS M. SANDES, F.R.C.S., hon. surgeon, London Lock Hospital; and Dr. A. GORDON SIGNY, pathologist, Infants Hospital, Vincent-square.

[2] The early paragraphs are taken from Appendix I of the report, by Dr. R. Cruickshank.

sponge, bed linen, or lavatory seat. The high incidence of infection in the parents of these children points strongly to this mode of transmission, especially in poorer homes where accommodation is inadequate. This fact emphasises the need for impressing adult sufferers from gonorrhœa with the necessity for protecting from infection any children with whom they come in contact. Direct infection by assault is not a common cause in this country. In institutions the infection may be spread by bed-pans, bed-pan covers, lavatory seats, towels, flannels or sponges, nurses' aprons, clinical thermometers, if rectal temperatures are taken, or enema nozzles.

In a series of 471 children (aged 3 to 14 years) admitted to the Children's Medical Home, Waddon, from March, 1928, to December, 1936, the analysis of causes, as given by the medical officers sending the cases, is as shown in Table I.

TABLE I

	Cases and per cent.
Accidental	160 (34·0)
Unknown or doubtful	98 (20·8)
Parental infection	120 (25·5)
Probably parental infection	21 (4·5)
Other contact in house	8 (1·7)
Assault	24 (5·1)
Probably assault	6 (1·3)
Relapsed	22 (4·6)
Ward infection	9 (1·9)
School infection (?)	3 (0·6)

DIAGNOSIS

Usually the inflammation and œdema of the urethral meatus and hymen are very typical and, after careful swabbing of the vulva, a probe passed into the urethra shows pus. The pus spreading back over the perineum may cause a rectal infection. The anus is red and moist and there is sometimes mucus on the fæces. The first rectal test may be negative, but if the vaginal discharge does not clear the tests should be repeated at intervals, otherwise an infection may be missed and there may be reinfection from the rectum later.

Incubation period.—In the great majority of cases the incubation period is three to four days, but in rare instances it may be longer.

Symptoms and signs.—There may be a complaint of vaginal discharge with burning or irritation of the vulva in young children, discomfort on walking, or frequency and pain on micturition. The lack of symptoms is often surprising, particularly in older children, and the mother brings the child to the doctor because the discharge is found on the clothing. In a *chronic case* there is a slight inflammation of the vulva and vagina with usually a scanty discharge which may be thin, purulent, or muco-purulent. The mucous membrane of the vulva is injected, particularly in the deep clefts between hymen and labia minora and just within the urethral meatus. The hymen is frequently torn and stretched. The cervix should be examined in these cases. In an *acute case* the diagnosis can readily be made on clinical signs alone. The vulva is hyperæmic or acutely inflamed, and bathed in pus which oozes from the vagina with any expulsive effort. The pus may be thick or thin, yellow or greenish. It is rarely blood-stained and never so offensive as in the case with foreign bodies in the vagina. In neglected cases there is excoriation of the labia majora, groins, and inner surfaces of thighs, with adherent crusts of dried pus.

Collection of material for bacteriological diagnosis.—Many failures to make a correct diagnosis are due to bacteriologists being supplied with material taken by unsuitable methods or by unskilled workers. Swabs should be taken only by a clinician expert at the task and never delegated to a member of the nursing staff unless she has been specially instructed. Both smears and cultures should be examined wherever possible since (*a*) Gram-negative diplococci other than the gonococcus are occasionally present in the vagina and (*b*) a diagnosis of gonococcal infection on smear alone will not be accepted in any medico-legal proceedings.

At least one assistant is essential to hold the child still in the correct position. The child is placed in the dorsal position with the knees drawn up and the thighs separated as far as possible without hurting the child, the external genitalia being exposed in a good light. Any superficial discharge is removed with wool and the labia separated with the gloved thumb and forefinger of the left hand.

Two *vaginal swabs* are taken with wooden or wire applicators round which a thin layer of good quality sterilised cotton-wool is firmly wrapped. The probe must be passed well into the vagina and withdrawn with some discharge on it. The first swab is used to make a thin even smear on a clean glass slide; the film is allowed to dry in air and is then preferably "fixed" by being passed through a gas or spirit flame several times, after which it is wrapped in paper and placed in the special slide box supplied for the purpose. Smears should never be packed while still moist. The other swab is used for inoculation of the culture medium, which may be done at the bed-side, or the swab may be transported as quickly as possible to the nearest laboratory.[3] Smears and swabs should be taken for culture from the *urethra and rectum* in proved gonococcal cases or in patients suspected of past or present gonococcal infection, or where there is any other special indication.

The complement-fixation test.—Most workers agree that the complement-fixation test is usually negative in the early stages of a gonococcal infection and therefore plays little part in the early diagnosis of vulvo-vaginitis in children. The evidence as to its value in the later stages of infection is still rather conflicting. The test should certainly not be regarded as an alternative to careful examination of films and cultures from the mucous membranes, especially in the early stages of an inflammation. Definite cases of gonococcal vulvo-vaginitis may have a negative complement-fixation test throughout.

Complications.—Cervicitis is one of the common causes of recurrence and it is possible that it is present in the majority of cases in the early stages. The cervix should not be examined as a routine, but only in those cases which relapse or fail to clear up with the usual methods of treatment. Ascending infection through the internal os causing an endometritis salpingitis or pelvic peritonitis occurs rarely, and, although urethritis is so usual, cystitis is also very rare. Gonococcal conjunctivitis and iritis are very uncommon and have never occurred as a complication at the Children's Medical Home, Waddon. In infants vulvo-vaginitis may occur concurrently with gonococcal ophthalmia, though not as a rule during the first few weeks of life. Later, a vaginitis in a child with ophthalmia may be overlooked as the eye condition is more serious and attention is focused on this. Ophthalmia as a secondary complication of gonococcal vulvo-vaginitis is very rare.

Table II shows the complications in 467 cases treated at the Children's Medical Home between 1928 and 1936.

[3] An interval of not more than three hours does not appreciably affect the viability of the gonococcus, provided as much material as possible is taken on the swab and the cotton-wool stopper is plugged tightly, but any period longer than this will render the specimen worthless.

TABLE II

	Cases and per cent.
Urethritis	377 (80·7)
Proctitis	55 (11·8)
Cervicitis	11 (2·3)
Warts	4 (0·8)
Endometritis and salpingitis	4 (0·8)
Purulent conjunctivitis (G.C. negative)	4 (0·8)
Tenosynovitis	2 (0·4)
Arthritis	1 (0·2)
Infected eye socket	1 (0·2)

TREATMENT

General nursing instructions.—The careful nursing of all children collected in hospitals and institutions is of the highest importance in the *prevention* of vulvo-vaginitis. The following measures are recommended for children with any form of vulvo-vaginitis:

(*a*) Certificated nurses only should be employed in the care of affected children *until* three negative swabs have been obtained in a period of not less than a week, and the condition is considered to be non-gonococcal on clinical grounds. Nurses employed in the care of affected children must not attend to unaffected children.

(*b*) Every affected child should have a separate bed-pan or chamber, unless provision is available for efficient sterilisation of such utensils after use.

(*c*) Special attention should be paid to the clothing of infected children. When the discharge is profuse, a light pad of non-irritating material is advisable, so as to minimise friction. All infected clothing should be soaked in a suitable disinfectant before being sent to the laundry.

General routine.—This should include all procedures likely to help in "building-up" the resistance of the patient and may in certain cases be the most important factor in arresting the infection. In-patient treatment with rest in bed is advisable during the acute stage for 1 to 3 weeks, and thereafter infants should lie and older children play for most of the day on a balcony or in the garden. Organised games, singing, and elementary lessons under a nursery governess help to prevent the dangers of "idle hands," but excessive exercise may be detrimental. The diet should be balanced and include milk, fruit, and fresh vegetables. Ultra-violet light is useful during the winter and for specially debilitated children.

Local treatment.—No packing of the vagina should be carried out and only non-irritating solutions should be employed. The vulva should be swabbed with lotion and dusted with a drying powder as often as necessary to keep it free from pus and as dry as possible. If the discharge is profuse, a Sitz bath may be given as a preliminary to treatment.

1. *Douching.*—Douching may be necessary to remove excessive vaginal discharge and may be employed as a routine. It is carried out with a rubber catheter attached to a douche can or to a Higginson's syringe, using protargol (¼ per cent.), tinct. iodi mitis (℥i to Oi) or Dettol (℥ss to Oi). Alternation of the solutions is advisable every two weeks.

2. *Swabbing.*—Opinion differs as to the value of swabbing or painting the vagina. Protargol (10 per cent.) or Milton (50 per cent.) in glycerin may be applied to the vagina on dressed throat swabs or wooden applicators, or on dressed Playfair's probes in older children.

3. *Urethral treatment.*—Routine swabbing or painting with 5 per cent. protargol or 1 to 2 per cent. silver nitrate is recommended by some when the canal is involved.

4. *Rectal treatment.*—Swabbing if used at all should be restricted to cases in which the rectum has been found to be infected with the gonococcus and carried out with the greatest care.

Special treatment.—(a) *Vaccine therapy* with a reliable stock gonococcal vaccine. Some authorities are definitely opposed to this form of treatment, but it has been recommended in chronic cases where there have been relapses and in the rare cases of tenosynovitis or arthritis. It should never be given during the acute stage.

(b) *Œstrin.*—Many observers have reported favourably on the use of œstrin. Œstrin can be given by mouth, by injection, or in the form of suppositories, the dosage being approximately five times as great by mouth as by injection. The oral method is probably to be preferred as children do not object to it, and the daily insertion of a vaginal suppository is considered undesirable. The daily dose is 3000 to 6000 units, according to the size of the child, and it may be given at one time, say every morning. The character of the discharge, macroscopic and microscopic, should be noted every day. The purulent gonococcal discharge soon gives place to one containing many squamous epithelial cells and Döderlein's bacillus but no gonococci. The duration of the treatment varies from a few weeks to a few months. Relapses may occur after or even during a course of œstrin and are then usually found to be due to a urethral or rectal infection; they usually clear up quickly with œstrin and associated treatment of the urethra or rectum. Unpleasant effects such as engorgement of the breasts, vaginal hæmorrhage, and especially masturbation have been ascribed to the use of œstrin by some observers.

(c) *Sulphanilamide and allied substances* have been used in some cases with encouraging results but it is too early to assess their value fully. Attention is drawn to the very varying degree of efficiency in the preparations of both œstrin and sulphanilamide now on the market. If good results are to be obtained the selection of a reliable preparation is essential.

RELAPSES

The tendency to bacteriological and clinical relapse is one of the features of this disease. These relapses may sometimes be of very short duration and pus may be present only for a few hours, so that a test may be positive on one day and negative when repeated the following day for confirmation. There may be no clinical signs in these latent cases, but the gonococci may be found in apparently clear mucus. Relapses may be due to reinfection from an insufficiently treated urethra, or from the cervix or rectum, but masturbation is a contributory factor. It is the persistence of this habit, after treatment has ceased, which makes a clinical diagnosis of cure very difficult in many cases. Reliance on the bacteriological reports is essential. The influence of bad hygienic conditions at home, of tight and dirty clothing, and of masturbation in prolonging an unhealthy appearance of the genital parts should not be forgotten. From 11 or even 10 years onwards, the physiological changes of puberty may be responsible for intermittent congestion of the parts, moisture, and mild leucorrhœa. None of these conditions should be mistaken for a genuine relapse. It is impossible to arrive at a correct diagnosis in such cases without the examination of films and cultures by an experienced bacteriologist.

It is of importance to remember the possibility of cross-infection and reinfection when considering apparent relapses. Very great care is required to prevent convalescent cases of vulvo-vaginitis in a hospital being reinfected by children still in the acute stage. It may also happen that a child discharged from hospital may be reinfected in her own

home (perhaps by the original source of infection) and then brought back to hospital with a complaint that she has relapsed.

CRITERIA OF CURE

The intractable character of gonorrhœal vulvo-vaginitis is shown by the long period of treatment and observation required—e.g., up to two years—even when the case is in skilled hands from the beginning. The marked tendency to bacteriological and clinical relapse, the uncertainty of finding the gonococcus in chronic discharges, and the obvious difficulty of proving a negative, lead to the necessity for extreme caution in giving a certificate of cure. But the question of when the child is cured, however controversial, cannot be evaded. Anxious parents must be reassured, schools must be advised when they can safely readmit pupils, and hospitals want to know when they may finally discharge patients. The clinician is required not only to determine whether a child is, at any particular moment, free from infection but also when the liability to relapse has ceased.

It may however be pointed out (1) That there is no direct evidence of gonococcal infection contracted in childhood lasting into adult life. Large numbers of patients who have suffered from gonococcal vulvo-vaginitis have now been followed up for many years and no such case is known. Moreover, the previous history of the thousands of adult patients who have attended the V.D. clinics during the past twenty years has been recorded with care, and no such tendency has been noted. (2) Exacerbations commonly occur in the early stages after treatment has ceased, although rarely after three months.

Criteria of cure should be negative tests (films, cultures, and gonococcal complement fixation) for a minimum of four months after cessation of all treatment. During this time the patient should be under observation at frequent intervals.—Daily inspection of the vulva is advisable for the first three months after suspension of treatment in view of the very short duration of some relapses, but this can be done quite adequately by an intelligent mother after the first few weeks. Normally the vulva clears up completely after treatment but there may sometimes be a persistent redness and slight discharge which is not pathological. After treatment has been discontinued a full set of films and cultures should be made from vagina, urethra, and rectum (if considered advisable). For a minimum of four months vaginal and urethral swabs should be taken at weekly intervals for the first three weeks and subsequently at intervals of two or three weeks. The final set of swabs and cultures should be taken after a provocative dose of vaccine administered 24 hours previously.

The place of the complement-fixation test among the criteria for cure of gonococcal vulvo-vaginitis is still undecided. When performed in a laboratory where such tests are being done weekly on a considerable scale and under well-controlled conditions, as in the Council's laboratories, the test has been helpful. When both the bacteriological and the serological tests are negative, cure may be assumed. When the bacteriological test is negative but the complement-fixation test remains positive for more than six weeks, the persistence of some hidden focus of infection may be suspected, but such persistently positive tests are rare. Change to a negative reaction is sometimes accompanied or followed by a recurrence of the vaginal discharge.

When a period of six months has elapsed after cessation of treatment without obtaining a "positive" result (bacteriological or serological), or definite clinical evidence of vulvo-vaginitis, there can, in the opinion of the committee, be no object in continuing observation of the patient. Such continuous observation will tend to perpetuate anxiety in those responsible for the child, to keep up bad habits if they exist, and to fix in the memory an unfortunate experience.

Non-gonococcal Vulvo-vaginitis

Non-gonococcal vulvo-vaginitis is not uncommon in girls between the ages of 2 and 7. It becomes relatively infrequent after that age and appears to be very rare after the age of 10. The conditions which may give rise to vulvo-vaginitis, or are found in association with it, are of a very diverse character. They are as follows:—

(*a*) *General causes.*—(1) Acute specific infections. It may develop as a prodromal symptom or sequela of the exanthemata or occur during the course of general acute infections, particularly pneumonia. It has also been observed in influenza and possibly in ordinary coryza. (2) General debilitating diseases and the anæmias. (3) Secondary to acute throat infections, most commonly streptococcal, but also in association with diphtheria and Vincent's angina.

(*b*) *Local causes.*—(1) Foreign bodies, such as safety-pins, marbles, or gauze-swabs, in the vagina. (2) Direct infection from fingers of attendants and by towels and clothing or by direct contact with dirt (as in children with inadequate clothing). (3) Secondary to irritation, congestion, or inflammation in adjacent organs—e.g., with threadworms, chronic constipation, appendicitis (acute or chronic), and infection of the renal tract. (4) Direct irritation of the parts by tight clothing or masturbation, which causes a local hyperæmia and predisposes to invasion of organisms.

DIAGNOSIS

Clinical signs.—A differential diagnosis between the various types of vulvo-vaginitis cannot be made without bacteriological tests, but certain clinical signs are highly suggestive. In "diphtheroid infections," for example, there is redness of the vulva and discharge, if present, is scanty. Discharge due to foreign bodies is characteristically blood-stained and offensive; that due to staphylococci is usually thick and creamy, whilst that caused by the streptococcus is thinner and colourless; and *B. coli* may give rise to an offensive discharge with a characteristic odour. The vaginal discharges which occur occasionally at the onset of a general infection may simulate any of these characteristics.

Bacteriological diagnosis.—A large variety of organisms have been found in smears or cultures from vaginal discharge, either singly or in combination. The relative frequency of the infecting organisms varies in different centres. For example, among 71 cases examined at the Hospital for Sick Children, Great Ormond-street, by Dr. Wood, non-hæmolytic streptococci (mostly enterococcus) were recovered from 51, *B. coli* and a typical coliform bacillus from 36, anaerobic Gram-positive cocci, *S. albus*, and diphtheroids from a quarter to half the cases, while the hæmolytic streptococcus was isolated from 10 and *S. aureus* from only 2 patients. In fever hospitals the most frequent causal organism is the hæmolytic streptococcus, most of the infections developing as complications of scarlet fever or tonsillitis. Rarely *C. diphtheriæ* produces a true diphtheria of the vagina although virulent strains may be present in the vagina without producing diphtheritic infection. Other organisms like the pneumococcus, *H. influenzæ*, Gram-negative cocci other than the gonococcus, and the tubercle bacillus

seem occasionally to be responsible for vulvo-vaginitis. *Trichomonas vaginalis* does not apparently produce infection in the child.

TREATMENT

Attention should be drawn to the very low infectivity of non-gonococcal vulvo-vaginitis. Familial spread is occasionally reported, but an epidemic in schools or hospitals or indeed the infection of any one child by another appears to be very uncommon. The presence of a focus of sepsis (especially of the hæmolytic streptococcus), however, obviously makes any child an undesirable occupant of a ward or dormitory.

Treatment calls for considerable judgment. Many cases are very mild and require little or no treatment except baths and local cleanliness and removal of any causal factor. Indeed the great danger is over-treatment, for prolonged swabbing and douching may not only keep up a vaginitis but actually increase it. Prolonged confinement to bed is very harmful, for it lowers the general health and leads to masturbation. The more severe infections should be treated on the same lines as the gonococcal cases, including œstrin therapy.

In a very small number of children the discharge proves extremely persistent and may fail to clear in twelve months or more. In troublesome infections, a short course of daily irrigations with lotions of iodine or chloramine T. may be given. Any septic focus present should be dealt with—e.g., tonsillectomy, dental extractions, or treatment for pyelitis or cystitis may be required. Convalescence in a suitable environment is invaluable in those cases which will not clear completely or tend to relapse, but it presents practical difficulties. Few, if any, convalescent homes welcome children with a recent history of vulvo-vaginitis whatever the cause!

CRITERIA OF CURE

The great majority of cases clear completely after 2 to 3 weeks' treatment, but it is advisable to keep the child under observation for 2 to 3 weeks after the discharge has ceased as recurrences are not unknown. In hæmolytic streptococcal infections the tendency to relapse may last for a considerable length of time. In view of the alarm caused by any vaginal discharge, children allowed to return to a residential school or institution should be examined at weekly or fortnightly intervals for two months after their return.

Administrative Aspects

This aspect of the problem is of great importance, for any authority or organisation undertaking the care of children, sick or healthy, is faced with two serious obligations—to protect non-infected children from the possibility of infection with the disease, and to detect, isolate, and treat any case of vulvo-vaginitis occurring in a child for whom it is responsible. For the protection of sick children, the committee have suggested certain instructions (see below) which have, with slight variations, been in operation in the London County Council's hospitals for over two years, and during this time there has been no spread of the disease. The plan of swabbing all female children on admission to hospital was rejected because with such a large number of child patients the procedure would be burdensome and would in no way obviate the necessity for other precautions.

As regards healthy children in the Council's residential schools and receiving homes, the staffs are asked to maintain a careful look-out for any sign or symptom of the disease. The children's underclothing and bed linen are watched for evidence of discharge, and any child considered suspicious is at once isolated and swabbed.

At these establishments the isolation of a suspicious case presents greater difficulty than in a hospital. Many institutions have little or no provision for the accommodation of potentially dangerous material, and the staff are naturally anxious to transfer any "suspicious" child as soon as possible. It has been found, however, that if too free encouragement is given to the transfer of girls to hospital children may be sent into hospitals quite unnecessarily, for conditions which are mere physiological incidents in development, or for transient and quite unimportant redness of the parts. Moreover, once a diagnosis of vulvo-vaginitis has been made, the child is marked out and her record is regarded with suspicion. If, however, definite clinical evidence of vulvo-vaginitis is present, an institution should not be expected to keep a child until bacteriological tests have been made and in no case should they be asked to keep a child who needs treatment.

Precautions for Healthy Children

(1) *Detection.*—The vulva and anal region of every female child under the age of fourteen must be inspected on admission, and a note of the condition entered on the case paper. Subsequent to admission a careful look-out should be kept for vaginal discharge.

(2) *Isolation.*—If a discharge is found, the child must be immediately isolated from all other unaffected female children, and a bacteriological examination made. The child may be barrier nursed in an adult female ward.

(3) *Contacts*—i.e., all the female children in the ward *unit* in which the suspected case has occurred—must be examined clinically without delay. Bacteriological examination should be made only if there is any evidence of vulvo-vaginitis, in which case the child must be isolated. The clinical examination of contacts must be repeated daily until the bacteriological examination of the original suspected case is completed. If the original case proves to be non-gonorrhœal, systematic clinical examination can be discontinued; if it proves to be gonorrhœal a bacteriological examination of the contacts must be made at once and the clinical examination continued daily. The bacteriological examination must be repeated if any further case develops, and a final bacteriological examination of all the contacts must be made eight days after the last case has been discovered in the ward.

(4) *Quarantine.*—Immediately there is a suspected case in a ward all admissions to and discharges from the ward must cease until either the case is proved to be non-gonorrhœal or the ward has been free of infection for ten days.

(5) *Nursing of non-affected children.*—The following nursing points apply to *all* female children:—

(i) The nurse must thoroughly wash her hands after attending to the toilet of the child. Rubber gloves may engender a false sense of security and so lead to neglect of washing.

(ii) The nurse's overall or apron may carry infection especially when she puts the child on her lap. It must be protected by a square of mackintosh, a separate one being reserved for each child. The mackintosh must be thoroughly cleansed with an antiseptic before and after use. Towels used for any child must be reserved for that child alone and should be thoroughly dried after use.

(iii) Each child should have a separate thermometer. If this is not possible, the patient's temperature should be taken either in the axilla or the mouth.

(iv) W.C.s, bed-pans, and chambers should be regarded as possible sources of infection, more particularly those with high seats which involve climbing, and should be thoroughly cleansed with a suitable antiseptic.

(v) No infant or child should, in any circumstances, be allowed upon another's cot.

UNITED STATES OF AMERICA

(FROM OUR OWN CORRESPONDENTS)

A CHALLENGE TO THE A.M.A.

AN unmistakable challenge to the present leadership of the American Medical Association was uttered in the presidential address of Prof. James H. Means to the American College of Physicians meeting yesterday (April 6th) in New York City. "The behaviour of the Association," Prof. Means said, "is political. It is partisan behaviour. It champions a cause. At the present time the cause is something close to standpatism." But the policy could be changed at any time, if the membership willed it. At present the electorate of the Association was apathetic and inarticulate because it had no issues, no platforms set up to vote for. "It is allowing the medical politicians to run things about as they please, and official spokesmen, like Jove on high Olympus, to hurl their thunderbolts of wrath at all who differ with orthodox doctrine." There was need of "medical statesmen, men of intellectual honesty, breadth of vision, courage, nobility of purpose, and the qualities of leadership, who can find the way to the solution of some of the problems of medical service which now baffle both the profession and the public." The development of enlightened opposition within the democracy of the national association was one way of bringing to light such leaders. There was no place for "yes-men" in a truly learned society, nor was there place for political manœuvring, or reprisal for the expression of honest opinion.

Among the orthodox concepts Prof. Means attacked were the "sacrosant doctor-patient relationship," the attitude of organised medicine toward group practice, the question of a third party determining the physician's fee, and the free treatment of the indigent patient.

"We hear a great deal," he said, "about the sacrosant doctor-patient relationship. No third party can be allowed to come between the two involved. This has been used as an argument against all attempts to improve the efficiency of medical service through group practice. When it is suggested that a disinterested outside person could with greater equity than the doctor determine what might be a proper fee for services rendered in any given case, there are storms of protest from the conservative wing of the profession. Yet a philosopher might recognise such an arrangement as an ideal one, and, as a matter of fact, it is actually working successfully in more than one place. . . . I submit that having a third party determine the size of and even collect the fee from the patient for the doctor is not only not an intrusion into the holy doctor-patient relationship, but actually increases the likelihood of the patient's receiving from the doctor the best and wisest treatment the doctor is capable of giving."

Another thing that stimulated the doctor to do his best by his patient was to have his work overseen by his critical colleagues. If this was an intrusion into the holy relationship, then it was to the patient's best interest to have an intrusion. The place where a patient was most likely to have his case diagnosed and treated correctly was in the public wards of a teaching clinic. This was not because the doctors are necessarily any wiser there, but because if one made a mistake another would observe and correct it. If one had some new information about diagnosis or treatment that applied to a given case, he would tell his colleagues about it.

Turning finally to the question whether physicians and surgeons should give their professional services to the care of the indigent, Prof. Means said it must be admitted that if the profession abandoned its traditional custom of giving its service freely to the poor, something of an intangible or spiritual nature would be lost.

"However, we have to face the realities of our own day, and it is not unlikely that in many instances at least the indigent will get better medical service if the community pays for it. It may be proper to add that even if the doctor is paid for caring for the indigent, he still has the opportunity to exercise his generosity, as does any other citizen, by giving of his substance to the most that he is able to the worthy causes of his community. Let him show the world that the doctor can be as good a citizen as any. Let him also, in rendering the service for which he is paid, add to it those qualities of spirit and purpose which cannot be bought with gold. Therein lies his chance to preserve the ancient values in the face of modern adaptations."

Unorthodox views had been expressed on April 4th, the first day of the conference, by Prof. John P. Peters of Yale University, who is the secretary of the committee of physicians which propounded a year ago certain Principles and Proposals now become famous, or infamous, according to the points of view of the 770 signators or of Dr. Fishbein (editor of the *Journal of the American Medical Association*), and the trustees of the A.M.A. Without referring directly to these principles and proposals Dr. Peters said that at present most of the advances in medicine which the rich enjoyed were developed in hospitals and institutions through the instrumentality of the indigent patients. The fees which the rich paid, however, did not as a rule return to the support of these institutions or the patients, but went to the practitioner who was exploiting the medical discoveries. It was his impression that government alone could assume the burden of providing, maintaining, and correlating the necessary medical resources.

"Such a suggestion immediately arouses cries of bureaucracy and corruption, as if these were inevitable attributes of our political system. The medical profession should be the first to deny such allegations. It is its proud boast that the public health services of this country have been free from corruption and politics. But, in any case, there is no good reason to believe that government direction would be worse than the whims and vagaries of philanthropists or the publicists and promoters who have the disposition of large funded fortunes. Nor are the subsidies from the manufacturers of proprietary foods, drugs, and medical instruments likely to direct education, investigation, and practice into the most desirable channels. It is my opinion, further, that cost must eventually be collected by general taxation. Those who can pay for their own care and prefer to patronise physicians of their own choice should not escape the general tax on this account; because this will not be imposed to pay for personal services but for the productive work that makes these services valuable."

Already the word "revolt" has reappeared in the headlines. It is perhaps better justified on this occasion than it was at the time of the publication of the Principles and Proposals. But it must be

correctly interpreted. The revolt is not a movement to found a new organisation or a new system of government. The dissident group considers that it has had undue difficulty in securing a hearing for its proposals and has been treated with intolerance, and it asks that the American Medical Association should be made "safe for democracy."

To-day (April 7th) the newly installed president of the College of Physicians, Dr. William J. Kerr, indicates that he endorses the position of his predecessor. On the other hand, in Chicago, Dr. Fishbein has told the Associated Press that Prof. Means is typical of those who stand outside and criticise without themselves putting a shoulder to the wheel to help, and adds that "his ignorance of what is going on is actually lamentable." Dr. Fishbein has also rebuked *News-Week* for reporting that the number of signators to "principles and proposals" has grown to 770. The report, however, is correct. The sponsoring committee has also been enlarged and now consists of the following: Russell L. Cecil (New York), Hugh Cabot (Rochester), Milton C. Winternitz, John P. Peters, and George Blumer (New Haven), Alan M. Butler (Boston), Louis Casamajor (New York), Thomas B. Cooley (Detroit), J. Rosslyn Earp (Albany), Channing Frothingham (Boston), L. Emmett Holt (Baltimore), William S. Ladd (New York), William S. McCann (Rochester), George R. Minot (Boston), Hugh J. Morgan (Nashville), Robert B. Osgood and Richard M. Smith (Boston), John H. Stokes (Philadelphia), Borden S. Veeder (St. Louis), James J. Waring (Denver), Soma Weiss (Boston), and William J. Kerr (San Francisco).

AUSTRALASIA

(FROM OUR OWN CORRESPONDENT)

THE STATE AND THE MEDICAL PROFESSION IN QUEENSLAND

CHANGES in the social structure of the community are everywhere being reflected in similar changes in the relation between the medical profession and the public. Queensland, like many other countries, is faced with the problem of adjusting this relationship.

The State government tends towards a hospitalisation programme, and in endeavouring to counter this tendency the Queensland branch of the British Medical Association has been urging a scheme of its own. In September, 1935, it published proposals for a national medical service for the State, based on the provision of a general practitioner for every family. The Association proposed that this should be financed by contributions through the friendly societies, and by government subsidy for unemployed and chronic invalids. The aim was to build the existing system of private practice and the friendly societies' medical service into a national medical service. The Association was opposed to full-time nationalisation and was emphatic that the patient's right of free choice of a doctor should be preserved. The Minister for Health's comment in 1935 was that the scheme was vague and indefinite, that it had not been supported by actuarial evidence, and that the Government would not commit itself without obtaining the fullest information. In the following February the British Medical Association asked for a joint committee to examine the policy for a general medical service, but the Minister replied that the Association should formulate a definite plan showing exactly what contributions would be required from the public, and what benefits contributors would receive. For two years no further progress was made.

The Commonwealth Government is now seriously considering a national insurance scheme which will include all States, and in this it has the support, in principle, of the federal council of the British Medical Association. The position in Queensland, however, has been further complicated by the appearance in the daily press on Jan. 12th of an "open letter" to medical men from the director-general of health and medical services. This "open letter" purported to be a request for coöperation with the Queensland Government, and shortly after its publication a questionnaire was sent to all practitioners in Queensland, in which they were asked to signify whether they were willing, if called upon, to enrol with the Department of Health, for various types of hospital, insurance, or preventive medical work, on a full-time or a part-time basis. As the Queensland branch of the British Medical Association had been complaining for some time that it had been unable to make contact with the Department of Health, much less coöperate with it, the appeal from the director-general was greeted with surprise. It is taken to mean that the Government proposes shortly to extend its activities to the provision of public medical services.

Two possibilities may be inferred from the letter—either that the Government would retain a limited number of doctors who would be wholly paid from public funds, or that a large number of doctors would be paid to devote part of their time to public medical service. It is not known to what extent any such scheme would be affected by the federal insurance plans. Presumably they would bear a portion of the cost of such a scheme. By the time the Commonwealth proposals can be put into effect the Queensland scheme would, it may be supposed, be well developed.

The letter refers to the increased demand by the poorer sections of the community for medical care, for which, under existing conditions, they are incapable of paying, and states that, without true coöperation and the establishment of a proper compromise, the problem as to how both curative and preventive needs can be met for people on the lower income ranges will grow continually more serious. "When it becomes sufficiently acute, it is obvious that the Government will intervene, and it will take its action in terms of the great masses of the population who require the service, irrespective, also, of whether its action interferes with the personal relation between medical men and the patient or does not."

Members of the Queensland branch have been advised by the branch council that they might reply in the affirmative to all the questions in the circular letter, with the proviso added: "the acceptance is subject to the qualification that the conditions of service are satisfactory, and have the approval of the branch." It is felt by practitioners in Queensland that no helpful advance has been gained by means of this step of the director-general, for the Government still is not committed to any future in particular. A frank discussion between the department and accredited representatives of the profession would have been a much more fruitful method of exploring possibilities for future coöperation.

AUSTRALASIAN COLLEGE OF PHYSICIANS

The legal incorporation of the Australasian College of Physicians will soon be completed. The college, it will be recalled, is a development from the Association of Physicians of Australia, a private society

with restricted membership, but one which was conducted with enthusiasm. The headquarters will be situated in Sydney, and a property has been acquired in Macquarie-street in the medical quarter of the city. The building is to be chiefly a New South Wales responsibility, and moneys from other States will be devoted to an endowment fund, which, augmented by dues from members, will be used to defray working expenses, to found scholarships for medical research, and to establish and maintain a library.

The college will be an examining body, and will provide a uniform higher qualification in medicine for practitioners in Australia and New Zealand. At present the requirements for doctorates in medicine in the universities of Australia and New Zealand are by no means uniform, and there seems to be little chance of obtaining uniformity. With the time not far distant when every member of the staff of a large hospital will be required to have a higher qualification in the special branch of medicine that he proposes to practise, it is anticipated that the college will not only act as a stimulus for the attainment of higher degrees, but will indirectly raise the standard of the practice of internal medicine.

LEGISLATION AGAINST FEE-SPLITTING

A Bill lately passed by the Legislative Assembly of Victoria makes it illegal for a medical practitioner to present an inclusive account for services rendered by himself and other doctors. There have been public complaints about the practice of issuing composite accounts and the sharing of fees, and the Medical Board of Victoria requested that action be taken to put an end to a method so open to abuse. Practitioners are now to be prohibited from demanding payment, presenting an account, or collecting fees for professional services rendered by any other medical practitioner, unless he be a partner, an assistant in his sole employment, or locum tenens. In order to prevent the defence being raised that doctors are carrying on their profession in partnership, all partnership agreements must be approved and registered by the Medical Board. The penalty is a fine of not more than £50 for the first offence, and a fine of not less than £50 and not more than £100 for a subsequent offence. Furthermore, a convicted doctor would be liable to be dealt with by the Medical Board for infamous conduct in a professional respect—the penalty for which may be deregistration.

At first the Victorian branch of the British Medical Association maintained that the Bill was unnecessary, and that its effect would probably prejudice confidence between doctor and patient. Later, while expressing regret at not having been given an opportunity to consider the details before its enactment, the branch meeting approved of the Bill and communicated their approval to the Government.

GRAINS AND SCRUPLES

Under this heading appear week by week the unfettered thoughts of doctors in various occupations. Each contributor is responsible for the section for a month; his name can be seen later in the half-yearly index

FROM A CONSULTING PHYSICIAN

IV

I HAVE always been interested in the application of the principles of biology and evolution to the arts and crafts. To a considerable extent the art of an age is representative of its mental attitude. This is well seen in architecture, though here the manifestations are also controlled by the technical skill and financial resources available. Note the flamboyance of Elizabethan romanticism gradually sobering down to the restrained dignity of the Georgian age of reason. With the earthquake of the French Revolution comes an outburst of individualism in architecture; no one style predominates. As industrialism advances massive buildings of the Babylonian and Egyptian styles appear—slave architecture, as it has been significantly called. Finally with more complete mechanisation comes factory architecture even for private dwellings and academic buildings.

* * *

Every great epoch in art runs its course in an astonishingly short time. First the development of the form and technique, then the full-blown flower, and then its decay in baroque extravagance. It is only necessary to mention the so-called Throne of Aphrodite, now in the Baths of Diocletian, the Hermes at Olympia, and the Laocoon in the Vatican to show that exactly the same sequence occurred in Greek sculpture. Spring, summer, and autumn follow as inevitably as in the seasons of the year. In very little more than fifty years from Marlowe's Tamburlaine the Elizabethan drama had blossomed, flourished, and declined.

There is another biological law which is in apparent contradiction with this. Once life has started it inevitably runs its courses—true; but in lowly organisms we meet with a phase of suspended animation. When conditions are unfavourable, there is a phase of encystment, which may be indefinitely prolonged, and emergence from which is followed by an active phase of rejuvenescence. I find in Byzantine art the parallel to this stage of suspended animation, since for about a thousand years it persisted with only minor alterations. To-day we are realising how much Byzantine mosaic and enamel owes to Persian art blending with what remained of the Greek. A revenge for Marathon indeed. But with the sack of Constantinople in 1204 and its final fall in 1453 the encysted life took on a fresh growth in its new environment. Byzantine art could remain static, but Italy in the fifteenth and sixteenth centuries was changing rapidly. The Sienese school tried to remain static but it became as deliberately out of touch with the art of its time as our pre-Raphaelites were with that of theirs.

* * *

Florentine and Umbrian painting never tried to stand still. It was eager and experimental. The Renaissance enormously stimulated an interest in the classics, and mythological subjects largely replaced sacred ones. The old gods came to life once more and inspired some of Botticelli's most beautiful pictures. Even in sacred pictures the note changed; the emphasis was different. You can trace it in the pictures of the Madonna. The early pictures follow the stiff hieratic Byzantine tradition and the next lay stress on the virginity; but now the emphasis was laid on the maternity. This, they seem to say,

is akin to the miracle that may happen in any home. Compare Raphael's Madonnas with Lippo Lippi's if you doubt this. Raphael fixed the style and his followers killed it. If we find him conventional, we must remember that it was he who created the convention.

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Whether the Crusaders' sack of Constantinople initiated the rise of Italian painting or no, the sack of Rome in 1527 by the troops of Charles V indubitably ended it. Only in remote Venice did it linger on. Titian, Palma Vecchio, and Gorgione started there together and it is usually thought that the last named was the dominant influence that formed their distinctive style. But Gorgione died young, while Titian continued to paint until his hundredth year. After Titian Venetian art still continued, though it gradually changed its form as Venice came to be the Monte Carlo of its day. But in the rest of Italy art died with Michael Angelo, who indeed was the father of the baroque. The Eclectic Schools of Rome and Bologna adopted the method of compilation. They selected the colour of one master, the design of another, and the technique of a third, expecting in this way to resume the excellencies of all. Unfortunately they left out the essential ingredient—the genius that inspired each.

* * *

How brief was the great period! When Botticelli was born in 1447 Fra Angelico was still painting; when he died in 1510 Raphael and Titian were established masters. Indeed, except for the earlier group of primitives, his 63 years of life overlapped those of all the great masters of Italian painting. In the retrospect it is quite easy to detect the period of decadence. Whether the present chaotic state of the arts is believed to mark the end of an epoch or the dawn of a new one depends on the temperament, and (as I hinted in my first article) on the age of the individual. Nevertheless I would suggest that as history records periods of artistic decadence, I may be right in my feeling that we are passing through such a one now. Yet however much my æsthetic susceptibilities may be outraged by the art of to-day, I am willing to hope that out of the present chaos a new art may still be born. The horizon of man's mind has widened enormously, not only by the material achievements of science but also by the stimulus it is affording to his imagination. After all, hope is of things as yet unseen.

PARLIAMENTARY INTELLIGENCE

WAR PENSIONS

IN the House of Commons on April 14th Mr. SIMPSON raised the question of pension allowance or non-allowance to disabled ex-Service men and their dependents. He asked for less rigidity, a broader outlook and a wider understanding of the duties of the Minister. Complaint was made of the meagre results and the mostly unfavourable verdicts when cases were brought to the notice of the Department. The Ministry needed more rope and less red tape. All kinds of experts and specialists were readily employed and quoted, but unfortunately these seemed more interested in economy and the fine adherence to schedules than in any broad approach to the involved human needs of the applicants. The investigations of the British Legion revealed that there were at least 95,000 ex-Service men who were unable to work through incapacity and who were in need of assistance. He urged the Government to set up a select committee to sift the evidence, to consider proposals and to listen to the insistent voice of criticism.—Sir HENRY MORRIS-JONES said that the duties of the Minister of Pensions were much more difficult now than 10 or 15 years ago on account of the vagueness of many of the complaints submitted. But medical men were most discouraged by the very great difficulty they experienced in getting a medical review of cases where they knew there was real hardship. Medical science had changed tremendously in the last 20 years—there was a different point of view in regard to matters of the heart and chest, for example. Could the Minister not set up a medical committee to secure a review of the various aspects of the medical complaints?—Mr. RAMSBOTHAM, Minister of Pensions, said he was prohibited from granting an entitlement to pension unless he received a medical certificate. The House would never expect him to press his advisers for medical certificates that might not represent their honest view of the case. It was not possible to grant war pensions on a mere possibility, but they could and did award them on a reasonable probability. Our expenditure on war pensions worked out at £53 per annum per disabled man, while in Germany the expenditure was £42 and in France £36. On the point raised by Sir H. Morris-Jones he had had no complaints in the past 12 months.—Sir H. Morris-Jones asked if that were not an indication of hopeless despair.—Mr. Ramsbotham said he did not think that was quite fair. The hon. Member should be aware that there was a system of independent medical experts of the highest repute selected from a panel of the Royal College of Physicians and the Royal College of Surgeons of whom he was making constant use. It was true that the administration of pensions was becoming more difficult. They were becoming concerned more and more with individual cases and less and less with general principles and policy. The reason was that the average age of ex-Service men to-day was about 50, an age at which men were subject to the various ailments resulting from the wear and tear of ordinary civilian life, such as heart trouble, rheumatism, and chest trouble, which were in exactly the same proportions among people in civilian occupations being dealt with by the approved societies. The Ministry endeavoured to give every opportunity to a man suffering from disabilities which he thought were due to war service to establish his case. They made researches for him with the approved societies, with the chemists' shops, with the employers in every direction where there was evidence to show that his complaint had a continuous history. In many cases those links could not be discovered and there was a long lapse between the war injuries and present ailments. A medical adviser could not then conscientiously say that the disability was the result of an injury suffered in the Great War. Unless that system was followed the sooner they abandoned a system of war pensions and called it something else the better.

NOTES ON CURRENT TOPICS

Foot-and-mouth Disease

In the House of Lords on April 12th Lord NUNBURNHOLME called attention to the recent outbreaks of foot-and-mouth disease and asked the Government if they had considered the question of taking further measures to limit transport and access from one parish to another in infected areas.—The Earl of FEVERSHAM, Parliamentary Secretary to the Ministry of Agriculture, said that the type of the disease in the present epidemic differed from that of last autumn and winter in taking a longer time to show its presence in the animal. In the last epidemic

outbreaks appeared simultaneously over many parts of the country without warning and without evidence of definite centres from which it was spread, and this led them to connect that epidemic with the migration of birds from the Continent which was going on at that time. In the present case the evidence suggested that the infection was picked up at certain important markets in the Midlands which distributed stock over the greater part of the country. In view of the danger of one of the worst outbreaks that this country had ever known and to obtain a breathing space to allow every animal which might have been exposed to infection to be tracked down the Ministry decided on April 4th to impose a stand-still order on the whole of England with the exception of certain counties in the far North and West. Since the imposition of this order five new centres of disease had appeared, but there were indications that the actual spread of infection would not prove to be so serious as at first was anticipated. The measures taken had well stood the test of experience over a number of years. In some countries on the Continent more severe restrictions had been imposed. Churches and cinemas had been closed and football matches prohibited, but he was not aware that such measures had had any great effect. On the Continent the slaughter policy which we could adopt because we lived on an island was not practicable. That meant that infection was not wiped out as it was here and the manufacture of the virus went on unchecked. In those circumstances it was hardly surprising that even more severe restrictions on movement should be advocated. He would point out that while they might close down their parish life they could not close down the life of the birds, ground game, and rodents and other vermin.—Viscount DAWSON OF PENN asked what was the evidence that birds were associated with this infection; and whether there was any particular bird which was thought to be guilty in this respect.—The Earl of FEVERSHAM said the outbreak in the autumn and winter was thought to be connected with the migratory birds which first landed on the East Coast and in the course of their usual flight went westward. It was thought that in particular the starlings might be the means of carrying the virus, but there was no conclusive proof. In the present outbreak, however, there was no evidence to show that spread was due to the flight of migratory birds more than to the movements of any ruminating animal.

On April 13th in the House of Lords the Royal Assent was given to the Middlesex Hospital Act.

The House of Lords rose on April 14th for the Easter recess until May 2nd and the House of Commons adjourned on the same day until April 26th.

QUESTION TIME

TUESDAY, APRIL 12TH

Blind Apprentices

Mr. MATHERS asked the Secretary of State for Scotland whether his attention had been drawn to a complaint made by the National League of the Blind against the action of the managing committee of the Edinburgh Royal Blind Asylum in entering into arrangements for the training of sighted apprentices; and whether he would represent to the institution in question that money voted for the blind should not be expended in the training of sighted persons, especially in view of the fact that when the training was completed there was no guarantee that the trainees would remain in the institution as instructors. —Mr. ELLIOT replied: Sighted workers are employed in the basket-making department of the Edinburgh Royal Blind Asylum, as in other institutions, to instruct or supervise the blind workers, and to do certain work, especially the fine work, which is unsuitable for the blind. I am informed that the directors of the asylum were unable to obtain trained sighted basket workers to replace those about to retire, and that they decided to take on not more than three sighted apprentices to be trained in basket making. The expenditure on this arrangement is met entirely from the voluntary funds over which I have no control. No part of the Government grant is utilised for the training of sighted apprentices.

Voluntary Hospitals and Air-raid Precautions

Mr. LOUIS SMITH asked the Home Secretary whether his attention had been called to the cost which would fall on voluntary hospitals if they took, as they were expected to do, the fullest measures of air-raid precautions to protect their patients and staff; whether he would make inquiries as to the views of hospital managements generally on this important issue; and whether he would then consider the grant to the hospitals of State assistance to ensure the necessary protection.—Mr. GEOFFREY LLOYD, Under-Secretary, Home Office, replied: Voluntary hospitals, like other institutions, are expected to take such measures as are reasonable in the circumstances for the protection of their patients and staff. There will, however, be some hospitals which will be used as casualty clearing stations under a local authority's scheme approved by the Secretary of State; in such cases the local authority could contribute to any special expenditure involved in their use and such expenditure, if approved, would in proper cases rank for grant under the Act.

Milk Pasteurisation

Captain ELLISTON asked the Minister of Health whether he would direct the attention of local authorities to the report of his department on the milk-borne outbreak of food poisoning involving over 100 persons at Wilton, in Wiltshire, and especially to the statement of the chief medical officer that this was an example of the class of outbreak which was due to infection of the milk by a diseased cow; that a clean raw milk was not necessarily a safe milk; and that the only practicable way to reduce the risk of such outbreaks to a minimum was by efficient pasteurisation or by some other suitable form of heat treatment.—Sir KINGSLEY WOOD replied: Copies of the report have been sent to the medical officers of health of all counties and county boroughs.

WEDNESDAY, APRIL 13TH

Insulin Treatment of Schizophrenia

Mr. RHYS DAVIES asked the Minister of Health whether he would place in the Library of the House a copy of the report of the international conference on the insulin treatment of schizophrenia; in what public and mental hospitals in this country that treatment had been applied and with what results; whether any steps were being taken to train a sufficient number of medical men and mental nurses in the technique of this treatment; and whether the treatment was in vogue in any private mental hospitals and, if so, what were the results in those cases.—Sir KINGSLEY WOOD replied: I will endeavour to arrange for a copy of the report to be made available. Insulin treatment is being applied in at least twelve public mental hospitals and six private institutions in this country. It is not practicable within the limits of an oral answer to deal with the questions raised in regard to results of treatment and training in the technique; but on these points I will communicate with the hon. Member.

Ex-Service Men in Mental Hospitals

Mr. KELLY asked the Minister of Pensions the number of ex-Service men who were under treatment in mental hospitals during 1937; and how many of these patients were discharged during the same year.—Mr. H. RAMSBOTHAM replied: The total number of officers, nurses, and men of other ranks for whose treatment in mental institutions my department was responsible during the year 1937 was 6015. During this period 175 cases were admitted, 136 were discharged and there were 152 deaths.

THURSDAY, APRIL 14TH

Closing of Children's School Camp

Sir WILLIAM JENKINS asked the Minister of Labou whether any steps were being taken by the Commissioner for Special Areas to close the school camp at Pembrey, where 350 children from distressed areas were taken fortnightly for health purposes; if so, for what purpose;

and was he making any arrangement for them in any other place to meet the needs of affected children.—Mr. ERNEST BROWN replied: The site of the school camp at Pembrey has been acquired by the War Office for defence purposes, and as a consequence the school camp is being closed not later than the end of June. In view of the short time available, it has not been possible to make arrangements for the provision of another camp to provide for the children who would, in the normal course, have been sent to Pembrey during the remainder of the season.

More Factory Inspectors

Mr. RHYS DAVIES asked the Home Secretary whether he could give the House any information as to the results of his promised review of the strength of the factory inspectorate.—Mr. GEOFFREY LLOYD, Under-Secretary, Home Office, replied: Yes, Sir. In view of the passing of the Factories Act of last session and of other developments, a scheme has been sanctioned which will have the effect of increasing the strength of the Inspectorate by 62 or about 23 per cent. over a period of three years. The scheme includes the appointment of an additional deputy chief inspector, and an additional superintending inspector to take charge of a new division which is being created in the Midlands, and the addition of three medical, one electrical and seven engineering inspectors. Some of the additional staff have already been recruited and further competitions are now being announced. It is difficult to forecast the effects of the new Act on the work of the department, and the scheme is subject to review in the light of experience.

Medical Men and Air-raid Duties

Mr. BULL asked the Home Secretary in what manner the services of doctors were being enlisted for duty in connexion with air-raids; and whether those who had offered their services for this work had been allocated to specific districts.—Mr. GEOFFREY LLOYD replied: Doctors will be required in connexion with air-raid precautions primarily for supplementing hospital staffs, and my right hon. friend is in consultation with the Minister of Health on the whole question of hospital provision. In the meantime the scheme for the training of doctors in anti-gas measures is proceeding steadily.

Removal of Hospital Patients from Vulnerable Areas

Mr. SANDYS asked the Home Secretary whether it was proposed to send a proportion of hospital patients from the more vulnerable areas to other parts of the country; and, if so, what arrangements had been made in the case of London.—Mr. GEOFFREY LLOYD replied: This is one of the matters in connexion with hospitals generally about which my right hon. friend is in consultation with the Minister of Health.—Mr. SANDYS: Have no arrangements yet been made in London?—Mr. LLOYD: We hope the survey of London will be completed in the next few weeks.—Mr. J. GRIFFITHS: Is the hon. gentleman aware that hospital accommodation in provincial towns is already overtaxed, and that if anything is to be done in this matter serious attention should be given to that fact?

Experiments in Prison Reform

Mr. GALLACHER asked the Secretary of State for Scotland if his attention had been drawn to the experiments in prison reform now being operated in certain English prisons; and if he would take steps to initiate similar experiments in Scottish prisons.—Mr. ELLIOT replied: As regards the first part of the question the reply is in the affirmative. Many improvements in Scottish prison conditions have been made in recent years and others are either in process of being introduced or are now being planned. The reclassification of prisoners, which is an essential preliminary to many of these improvements, was begun on April 1st and is now actively in progress. The desirability of assimilating the conditions in Scotland and England as far as possible is constantly borne in mind.

Tuberculosis Eradication in Herds

Mr. ROBERT GIBSON asked the Minister of Agriculture what counties in England and Wales, respectively, contained the largest number of animals in attested herds; how many such animals were in each of these counties, respectively; to what breeds of cattle these animals belonged; and if he had any statement to make on the subject.—Mr. MORRISON replied: With regard to the last part of the question, the herds most suitable for tuberculosis eradication are those maintained by breeding within the herd. Such herds are numerous in the counties of Carmarthen and Pembroke, in which the largest numbers of attested herds are located. The counties in England and Wales which contain the largest numbers of animals in attested herds are as follows:—

County.	Number of attested herds.	Cattle in attested herds.	
		Approximate number.	Breeds.
ENGLAND:			
Somerset ..	60	3050	Various.
Berks	34	2450	"
Essex	36	2150	"
Surrey	34	2150	"
Hampshire ..	38	1950	Mainly Guernsey and Jersey.
Gloucester ..	31	1800	Various.
WALES:			
Carmarthen ..	336	9450	Mainly shorthorn.
Pembroke ..	114	3100	Various, shorthorn predominating.
Cardigan ..	72	1950	Mainly shorthorn.

Local Authorities and Food and Drugs Powers

Mr. BULL asked the Minister of Health the number and names of councils which, under the new Food and Drugs Bill, would lose their authority in matters affecting the control of food and drugs in their respective areas.—Sir KINGSLEY WOOD replied: I presume that my hon. friend is referring to the councils of the 18 non-county boroughs, mentioned in the third interim report of the Local Government and Public Health Consolidation Committee. These are food and drugs authorities under the existing law, but which could not be such authorities under clause 64 of the Bill so long as their population does not amount to 20,000. The names of these councils are: Banbury, Barnstaple, Berwick-on-Tweed, Boston, Bridgwater, Bury St. Edmunds, Carmarthen, Clitheroe, Congleton, Glossop, Grantham, Kendal, Newark-on-Trent, Newbury, Penzance, Tiverton, Warwick, Wenlock. The position of 23 other boroughs with a population between 20,000 and 40,000 would depend upon whether a direction were given under the proviso to the clause that they should continue to be food and drugs authorities.

ROYAL MEDICAL BENEVOLENT FUND.—At a recent meeting of the committee 19 annuities and 45 grants were awarded. The total amount voted was £1650. The following are particulars of three cases:—

Widow, aged 69, of M.R.C.S. who died in January, 1938, and whose estate consists solely of the house now occupied, a 1934 Austin 10 h.p. car, and the household furniture. After sale of the house and payment of outstanding debts it is expected the capital remaining will not exceed £300. The widow has received no money since her husband's death. The fund sent an immediate gift of £5 and has voted a further £46 for this year. Application is being made to other societies for assistance for this poor lady.

Widow, aged 83, of L.R.C.P. who died in 1915, is living with her two sisters. One sister, a skilled nurse, looks after the widow and other sister, who is also an invalid. The doctor in attendance reported that the widow is suffering from arthritis and is completely crippled, and emphasised the necessity of her having a permanent attendant, but her financial position would not allow of this. Fund voted £26.

Doctor, aged 65, wife aged 48. The doctor is suffering from progressive muscular atrophy. Fund voted £80 per annum to the doctor and £26 per annum to his wife. The shipping firm for which he worked as a surgeon is contributing £30 per annum.

New annual subscribers are urgently needed by the fund. Cheques may be sent to the hon. treasurer of the fund, 11, Chandos-street, London, W.1.

PUBLIC HEALTH

The Midwife and Her Training

On the first day of next month the new rules of the Central Midwives Board for the longer training of midwives begin to come into force. The length of training will be extended from six months to one year in the case of trained nurses and from one year to two years in all other cases, divided into (1) a period of six or eighteen months according to whether the pupils are or are not trained nurses, (2) a period of six months for all pupils. Only on completion of the second part can the examination for the certificate of the C.M.B. be taken.

Under Section 7 of the Midwives Act, 1936, local supervising authorities are under an obligation to arrange for all practising midwives in their area to take post-certificate courses, and the C.M.B. have now made rules prescribing the nature and the extent of these courses. All practising midwives are required to take these courses at least once in seven years with a view to maintaining contact with modern theory and practice.

Grants are payable by the Treasury in aid of the training of persons intending to practise as midwives (see Memo. 211/MCW, 1*d*.), through training institutions recognised by the C.M.B., at the rate of £20 per pupil for each period of six months' training and £52 10*s*. for the eighteen months' period. To be eligible for a grant the candidate must declare her intention to practise. Proportionate grant will also be payable in respect of post-certificate courses.

In view of the already long training imposed on health visitors, it has been decided that in future their midwifery training need only extend to Part I of the new training course for midwives. Grant will be payable in respect of this portion at the rate applicable to intending midwives.

The New Public Health

In the last few years two tendencies have been apparent in the development of the public health services and are emphasised in the annual report of the Department of Health for Scotland.[1] The first has been the evolution of a system of unbroken medical supervision throughout childhood and adolescence. In the earlier part of this century the efforts of preventive medicine were directed at certain defined objects; thus the high death-rate during the first year of life was met by an efficient infant welfare service, and the loss of school attendance through ill health led to the creation of a school medical service. It gradually became clear, however, that many infantile deaths and much of the sickness of school-children were due to causes which had operated at an earlier age—namely, before or during birth or in the pre-school period. This has necessitated the extension of services to cover the health of the expectant mother and to provide skilled assistance at childbirth, and the establishment of clinics and nursery schools for the routine examination and treatment of children under school age. Finally, the gap between school life and the time when insurance benefit becomes available is being bridged by extending insurance facilities to juveniles under 16 and by supplying insurance practitioners with information from the school records.

[1] Ninth annual report of the Department of Health for Scotland. 1937. London: H.M. Stationery Office. Pp. 220. 3*s*. 6*d*.

The second tendency is in the organisation of the health services themselves. This has depended upon the fact that the financial and general resources of the smaller areas of local government have no longer been sufficient to keep pace with the increasing complexity and specialisation of the treatment of the sick. In the tuberculosis service, for example, even the minor local authority was financially competent to erect a small institution to provide the patients of its district with rest and nursing under open-air conditions, but the increasing use of radiology, the introduction of collapse therapy, and the employment of surgery for certain cases have entirely altered the situation, and the small sanatorium maintained by a single authority must now give place to a large well-staffed and well-equipped institution in which the authorities of a large district coöperate. Modern orthopædic schemes have shared in this regional planning, as have the hospitals for infectious diseases, which now aim at providing the best possible treatment for the patient and not merely isolation for the protection of the community. Large-scale rationalisation has still to be applied to the hospital services, but it is in that sphere that coöperation over wide areas is most essential in order to avoid overlapping, waste, and the uneconomical employment of expensive equipment. There is no room for parochialism in modern medicine.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED APRIL 9TH, 1938

Notifications.—The following cases of infectious disease were notified during the week: Small-pox, 0; scarlet fever, 1990; diphtheria, 1351; enteric fever, 17 (28 "expected"); pneumonia (primary or influenzal), 1086; puerperal fever, 199; cerebro-spinal fever, 41; acute poliomyelitis, 5; acute polio-encephalitis, 2; encephalitis lethargica, 9; dysentery, 87; ophthalmia neonatorum, 103. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on April 15th was 5436, which included: Scarlet fever, 802; diphtheria, 1140 (carriers 45); measles, 2220; whooping-cough, 264; puerperal fever, 15 mothers (plus 9 babies); encephalitis lethargica, 283; poliomyelitis, 1. At St. Margaret's Hospital there were 26 babies (plus 13 mothers) with ophthalmia neonatorum.

Deaths.—In 125 great towns, including London, there was no death from small-pox or enteric fever, 56 (15) from measles, 5 (0) from scarlet fever, 20 (3) from whooping-cough, 44 (7) from diphtheria, 50 (14) from diarrhœa and enteritis under two years, and 56 (8) from influenza. The figures in parentheses are those for London itself.

Measles was fatal in 27 great towns; Manchester had 4 deaths, Reading, Barnsley, Hull, and Salford each 3. Diphtheria was fatal in 30 great towns, Liverpool reporting 5 deaths. Birmingham reported 10 deaths from influenza.

The number of stillbirths notified during the week was 285 (corresponding to a rate of 40 per 1000 total births), including 44 in London.

INSTITUTE OF BRITISH SURGICAL TECHNICIANS.—A lecture on the uses of instruments in surgical technique will be given by Mr. W. H. Ogilvie to this institute on Friday, April 29th, at 8.15 P.M., at the Welbeck Hotel, Welbeck-street, London, W. Members of the medical profession may obtain tickets from the secretary of the institute, 6, Holborn-viaduct, London, E.C.1.

OBITUARY

SIR ROBERT HILL, K.C.B., F.R.C.S.

Surgeon Vice-Admiral Sir Robert Hill, who died on April 18th at Henley in his seventy-third year, was honorary surgeon to the King and was recognised throughout his career as one of the best all-round surgeons in the Navy. Son of Dr. Samuel Hill, who practised in Mecklenburg-square, he qualified in 1888, taking the F.R.C.S. Eng. five years later. He joined the Navy in July, 1890, and retired at his own request as medical director-general in October, 1923. As staff surgeon he served in H.M.S. *Ophir* during the Royal Colonial tour of 1901 and as fleet surgeon he served in H.M.S. *Renown* during the tour of the Prince and Princess of Wales in India (1905–06), as well as in H.M.S. *Medina* during the Royal Indian tour of 1911–12. In the early part of the late war he did valuable surgical work at the Royal Marine Infirmary, Deal, and in February, 1916, he was appointed to H.M.S. *Iron Duke* as principal medical officer to the Grand Fleet on Admiral Jellicoe's staff. He was specially recommended for promotion for services rendered in the action of Jutland, when Jellicoe described him as "a most valuable medical officer with great organising ability." He was created K.C.M.G. in 1919 on his appointment as director-general.

A colleague writes: "Sir Robert Hill had a charming personality and was popular with the officers of all branches of the Service, amongst whom he had an unusually large number of acquaintances. He was a delightful senior to work under and his great experience in all departments at sea or on shore was most helpful when difficult questions arose. He was always pleased to see any of the officers of the medical branch, and did his utmost to help them, possessing as he did a thorough knowledge of their capabilities and the posts they would most suitably fill. When he was appointed director-general he had a busy time, dealing especially with the reduction of the medical personnel, but he never allowed himself to be worried, and his good humour surmounted any difficulty. The position of medical director-general gained in dignity during his tenancy of it, and when he retired the medical officers felt they had lost a capable guide and a good friend."

Dr. MICHAEL GRABHAM, who died at Quinta do Val, Madeira, on April 13th, was son of the Dr. Michael Grabham who practised in Madeira during the whole of his long life. After graduating at Cambridge he qualified from St. Thomas's in 1891 and practised for many years at Kingston, Jamaica. He was in his seventy-second year.

Mr. CHARLES EDWIN TRUMAN, a governor of St. Thomas's Hospital, who died at Upton, Slough, on April 14th in his eighty-ninth year, had been surgeon-dentist to the hospital and to H.M. Household. He was the only son of Mr. E. T. Truman, M.R.C.S., who combined medicine with the expert knowledge of telegraphy which entitled him to give substantial help in the laying of the first Atlantic cable. After taking the natural sciences tripos at Cambridge in 1871 Mr. Truman became M.R.C.S. in 1875 and L.D.S. in 1881. He was a member of the Odontological Society and surgeon also to the Dental Hospital of London. His wife, who was a descendant of Archbishop Herring, predeceased him by a few months.

MEDICAL NEWS

British Postgraduate Medical School

Dr. H. Gardiner-Hill will give six lectures in the department of medicine on diseases of the ductless glands on Tuesdays beginning on May 10th. On Thursdays beginning on May 26th Prof. J. C. Drummond, D.Sc., will lecture in the department of pathology on practical aspects of modern vitamin research. All the lectures will be held at 4.30 P.M. A limited number of tickets are available to medical practitioners and may be had from the dean of the school, Ducane-road, London, W.12.

Health and Cleanliness Council

At a luncheon held at the Holborn Restaurant on April 13th, Dr. G. F. Buchan, president of the council, presided, and Lord Horder proposed the toast of The Council. This stood, he said, for preventive medicine in regard to the individual and in regard to the home. Little children took kindly to cleanliness if they were shown how and were given the necessary facilities. A dirty tenant made a dirty house, and dirty houses helped to make new slums; the council aimed at seeing that no tenant contributed towards the making of slums by giving advice to the housewife. The Council had three great allies in its work—the mother, the school teacher, and the child; so long as it concentrated upon these three it could not fail in its work. Dr. Buchan, in reply, said he became more convinced as time went on that cleanliness was the foundation of all health work. In 1937 the council took part in 320 baby weeks, 650 lectures were given to audiences totalling nearly 50,000, the cinemotor displayed health films in every part of the country, and nearly 4,000,000 leaflets on health educational matters were distributed. At the suggestion of Dr. J. A. Fairer a conference of health workers had been held in Leicester. He realised that the achievement of cleanliness meant large expenditure, but it was money well spent for the reduction in infantile mortality. The council hoped the campaign would achieve the emancipation of the housewife from household drudgery by the introduction of various mechanical and electrical devices.

British Orthopædic Association

The Robert Jones gold medal and prize of £50 for 1937 has been awarded to Mr. H. Jackson Burrows for his essay on coxa plana.

Royal College of Physicians of Edinburgh

Dr. E. A. Carmichael will deliver the Morison lectures on the study of reflex activity of the human autonomic nervous system in the hall of the College on Thursday and Friday, May 26th and 27th, at 5 P.M.

The college will shortly make an award of the Dr. Jessie Macgregor prize in medical science.

The value of the prize is about £50, and all medical women who are graduates in medicine of the University of Edinburgh or who have taken the triple qualification and studied for at least a year in Edinburgh before qualification are eligible. The successful candidate will deliver a lecture to the medical profession in Edinburgh on the work she has submitted. Further particulars will be found in our advertisement columns.

Pathological Research in its Relation to Medicine

Our advertisement columns contain particulars of a course of lectures on this subject to be given in the institute of pathology and research at St. Mary's Hospital at 5 P.M. on Tuesdays from April 26th to June 14th. The first will be given by Dr. Donald Hunter, who will speak on the toxicology of certain compounds of lead, arsenic, and mercury. Other speakers will be Sir Thomas Lewis, F.R.S., Dr. R. A. Young, Prof. John Mellanby, F.R.S., Prof. Matthew Stewart, Prof. B. A. McSwiney, Sir Henry Dale, F.R.S., and Sir John Fraser. The lectures are open to all members of the medical profession.

Royal Society of Medicine

The gold medal of this society, given triennially in recognition of services to the science and art of medicine, has been awarded to Prof. Wilfred Trotter, F.R.S., director of the surgical unit at University College Hospital, London. Mr. Trotter is the seventh recipient of the medal, his predecessors being Sir Almroth Wright, Sir Gowland Hopkins, Prof. J. S. Haldane, Sir Henry Head, Sir Thomas Barlow, and Sir Archibald Garrod.

Society for Relief of Widows and Orphans of Medical Men

At a quarterly court of directors held on April 6th, Mr. V. Warren Low, the president, being in the chair, the annual report and financial statement for 1937 was submitted and approved. During the year £4702 10*s.* had been distributed in grants to the widows and orphans. There was a surplus of income over expenditure of £513, due partly to the inability, owing to the increase of the number of widows in receipt of grants, to make a Christmas present to them. A donation of £127 4*s.* had been received from the Bovril Medical Agency. The annual general meeting will be held on May 25th. Membership is open to any registered medical man who at the time of his election is residing within a twenty-mile radius of Charing Cross. Particulars from the secretary, 11, Chandos-street, London, W.1.

British Empire Cancer Campaign

At a quarterly meeting of the grand council held in London last week a further grant of £1000 for one year was placed at the disposal of the north of England council to enable the "short"-wave investigations to be continued under the direction of Mr. F. Dickens, Ph.D., and Mr. S. F. Evans, Ph.D. (see *Lancet*, April 2nd, p. 787). The grand council decided to allot a further sum of £1338 for one year for extension of the work of the central propaganda committee, which will now proceed to arrange free educational lectures in Cornwall, Devon, Dorset, Gloucestershire, Somerset, Wiltshire, and in South Wales. Mr. Malcolm Donaldson, chairman of the committee, reported that over 700 public lectures have been given in fifteen English counties. Sir Charles Gordon-Watson reported that the organisation for the statistical cancer inquiries in the teaching and special hospitals of London and the hospitals of the London County Council and the Middlesex County Council have now been completed. All these institutions had appointed registrars to take charge of the records, and the headquarters' arrangements were being perfected to deal with the data concerning over 17,000 new cases of cancer yearly in the metropolitan area.

SUCCESS OF THE LONDON AMBULANCE SERVICE

THE statistics of the London Motor Ambulance Service for 1937 exhibit the continuous growth of that beneficent municipal provision. There were no fewer than 55,486 calls last year, or 13,000 more than in 1933. The 25 ambulances in commission working from 16 stations travelled 264,464 miles and the average time taken to reach cases was 7·1 minutes, or if street accident cases only were considered 6·6 minutes. The largest number of calls was in the month of May, and Friday was the day in the week for which an ambulance was most frequently summoned, Saturday and Monday following next in order. The hour of noon till 1 o'clock was that when an ambulance was most in request, closely followed by 6–7 and 3–4 P.M. Lambeth appears to be the borough council area from which most calls were received. The largest number of calls was for street accidents (16,289), while there were 8590 for accidents elsewhere than in the street. No fewer than 12,665 or 22 per cent. of the whole number of calls were for cases of parturition. That the public are now familiarised with the availability of the service is shown by the fact that they made 29,108 calls, against 18,073 from the police. When the obstacles which were placed in the way of passing the Metropolitan Ambulances Act between 1906 and 1909 and the opposition to its effectuation in 1909 to 1915 are recalled (see *Lancet*, 1936, **2**, 720), it is easy to see how ill-informed was the obstruction.

Vacancies

For further information refer to the advertisement columns

Accrington, Victoria Hosp.—H.S., at rate of £175.
Altrincham General Hosp.—Sen. and Jun. H.S.'s, £150 and £120 respectively.
Bangor, Caernarvonshire and Anglesey Infirmary.—Jun. H.S., £120.
Barnsley, Beckett Hosp. and Dispensary.—Cas. O., £250.
Birmingham, Canwell Hall Babies' Hosp.—Res. M.O., at rate of £250.
Birmingham City, Maternity and Child Welfare Dept.—M.O., £600.
Birmingham and Midland Eye Hosp.—H.S., at rate of £130.
Bristol City and County.—Asst. M.O.H., £500.
Dartford, Bergman Osterberg College.—Lecturer in Physiology and Hygiene.
Dudley, Guest Hosp.—Res. Surg. O., at rate of £250–£300. Also H.S., at rate of £100–£130.
Dundee Mental Hosp., Westgreen.—Jun. Asst. M.O., £300.
Edgware, Redhill County Hosp.—Visiting Dermatologist, 3 guineas per session.
Edinburgh, Royal College of Physicians.—Dr. Jessie Macgregor Prize in Medical Science, £50.
Halifax Royal Infirmary.—Second H.S. to Eye, Ear, Nose, and Throat and Medical Dept., at rate of £175.
Hastings, Royal East Sussex Hosp.—Jun. H.S., at rate of £150.
Hendon Borough.—Asst. M.O.H. and Asst. School M.O., £600.
Holland (Lincs) County Council.—Asst. M.O.H., £700.
Hosp. for Sick Children, Great Ormond-street, W.C.—Res. Asst. Physician, £200. Out-patient M.O., £150. Two Res. Med. Assts. and Clin. Pathologists, each £125. Asst. Res. Surg. O., £100. Also H.S., at rate of £50.
Huddersfield County Borough.—Asst. M.O.H., £500.
Huddersfield Royal Infirmary.—H.S. to Abnormal Maternity Dept., H.S. to Ear, Nose, and Throat Depts., and H.S., each at rate of £150.
Ilford, King George Hosp.—Asst. Cas. O. and H.S. to Spec. Depts., at rate of £100.
Isleworth, West Middlesex County Hosp.—Res. Cas. M.O., £350.
King Edward Memorial Hosp., Ealing.—Cons. Physician and Second Cons. Laryngologist. H.S. to Special Depts., at rate of £150. Ophth. Surgeon, also 2 Hon. Anæsthetists.
Leicester City General Hosp.—Res. M.O., at rate of £300.
Lewisham Metropolitan Borough.—Asst. Maternity and Child Welfare M.O., £600.
London Chest Hosp., Victoria Park, E.—Med. Reg., £175.
London Corporation.—M.O.H. for Port of London, £1500.
London County Council.—Asst. M.O.'s, each £470. Also Asst. M.O.'s, Grade II, each £250.
London Lock Hosp., 283, Harrow-road, W.—Res. M.O., at rate of £175.
Maidenhead Hosp., Berkshire.—Hon. Surgeon to Ear, Nose, and Throat Dept.
Manchester Royal Eye Hosp.—Out-patient M.O., £200.
Manchester Royal Infirmary.—Bacteriologist for post of Director of Clin. Laboratory, £800. Also Chief Asst. to Surg. Unit, £250.
Manchester, Withington Hosp.—Asst. M.O., at rate of £200.
Middlesex County Council.—Asst. Dental Officer, £500.
Middlesex Hosp., W.—Obstet. and Gynæcological Reg., £300.
Mount Vernon Hosp., Northwood.—H.S., at rate of £150.
Newcastle, University of Durham and Royal Victoria Infirmary.—Professorship of Pathology and Pathologist, £1100.
Newcastle-upon-Tyne Royal Victoria Infirmary.—Reg. to Orthopædic Dept., £150.
Newport, Mon., Royal Gwent Hosp.—H.S. to Fracture and Orthopædic Dept. and Cas. O., each £135.
Nottingham City Hosp.—Res. Asst. Surg. O.'s, each at rate of £250.
Nottingham General Hosp.—Res. Cas. O., at rate of £150.
Oxford, Wingfield-Morris Orthopædic Hosp., Headington.—H.S., at rate of £120.
Paddington Green Children's Hosp., W.—H.S., at rate of £150. Also two Clin. Assts.
Plymouth, Prince of Wales's Hosp., Devonport.—Jun. H.S., at rate of £120.
Preston Royal Infirmary.—Cas. O., at rate of £150.
Queen's Hosp. for Children, Hackney-road, E.—Cas. O., at rate of £100.
Queen Mary's Hosp. for the East End, Stratford, E.—Hon. Asst. Surgeon.
Rochdale Infirmary and Dispensary.—Second H.S., £150.
Rotherham Hosp.—H.P., £180.
Royal Free Hosp., Gray's Inn-road, W.C.—Sen. Res. M.O., £150.
Royal London Ophthalmic Hosp., City-road, E.C.—Out-patient Officer, £100.
Royal Naval Dental Service.—Dental Officers.
Royal Naval Medical Service.—Medical Officers.
St. Bartholomew's Hosp., E.C.—Part-time Chief Asst. in X Ray Diagnostic Dept.
Salisbury General Infirmary.—H.P., at rate of £125.
South-Eastern Hosp. for Children, Sydenham, S.E.—Hon. Asst. Surgeon.
Staffordshire General Infirmary.—Sen. H.S., at rate of £175.
Stirling District Mental Hosp., Larbert.—Jun. Asst. M.O., £300.
Stoke-on-Trent, Burslem, Haywood, and Tunstall War Memorial Hosp.—Res. H.S., at rate of £175.
Stoke-on-Trent City.—M.O. for V.D. Centre, £750.
Stoke-on-Trent, North Staffordshire Royal Infirmary.—Res. Anæsthetist, at rate of £150.
Stoke-on-Trent, Stanfield Sanatorium.—Res. M.O., £250.
Sunderland Royal Infirmary.—Jun. H.S., £120.
Wakefield Mental Hosp.—Asst. M.O., £350.
Weir Hosp., Grove-road, S.W.—Jun. Res. M.O., £150.
Wembley Borough.—Asst. M.O.H., £500. Also Part-time Asst. M.O., 1½ guineas per session.

West London Hosp., Hammersmith-road, W.—Chief Asst. to Dept. for Chronic Rheumatic Diseases, £100.
Westminster Hosp. Convalescent Home, Parkwood, Swanley, Kent.—Res. M.O., at rate of £200.
Worcester Royal Infirmary.—Jun. H.S., £120.

The Chief Inspector of Factories announces vacancies for Certifying Factory Surgeons at Llandrindod Wells (Radnor), Billingborough (Lincolnshire), Haddenham (Cambridgeshire), and West Calder (Midlothian).

Medical Diary

April 25th to May 1st

SOCIETIES

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

MONDAY.
Odontology. 8 P.M., Mr. S. Wilson Charles: The Developmental Movements of the Teeth. Mr. G. T. Hankey: Osteitis Fibrosa (Local) of Mandible Simulating Osteogenic Sarcoma.

TUESDAY.
Medicine. 5 P.M. (cases at 4 P.M.), clinical meeting at the Middlesex Hospital.

WEDNESDAY.
Epidemiology and State Medicine. 8.15 P.M., Dr. W. A. Daley: School Life and After for the Handicapped Child.

THURSDAY and FRIDAY.
Urology. Annual general meeting in Stockholm.

MEDICO-LEGAL SOCIETY.
THURSDAY.—8.30 P.M. (26, Portland-place, W.), Mr. William Latey: Medico-legal Aspects of the Matrimonial Causes Act, 1937.

CHELSEA CLINICAL SOCIETY.
TUESDAY.—8.30 P.M. (Hotel Rembrandt, Thurloe-place, S.W.), Dr. L. I. M. Castleden: The Uses of Dyes in Medicine.

ST. JOHN'S HOSPITAL DERMATOLOGICAL SOCIETY, 5, Lisle-street, W.C.
WEDNESDAY.—4.30 P.M., clinical cases. 5 P.M., Dr. J. H. T. Davies: Minor Surgery of the Skin with Special Reference to Biopsy.

BRITISH PSYCHOLOGICAL SOCIETY.
Medical Section.
WEDNESDAY.—8.30 P.M. (Tavistock Clinic, Malet-place, W.C.). Dr. H. G. Baynes: Psychological Demonstration of the Drawings of a Schizophrenic Artist.

MEDICAL SOCIETY FOR THE STUDY OF VENEREAL DISEASES.
FRIDAY.—8.30 P.M. (11, Chandos-street, W.), Dr. A. J. Galbraith: Some Problems in the Histopathology of General Paralysis of the Insane.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

BRITISH POSTGRADUATE MEDICAL SCHOOL, Ducane-road, W.
MONDAY.—2.30 P.M., Sir Edmund Spriggs: Diseases of Small and Large Intestine.
WEDNESDAY.—Noon, clinical and pathological conference (medical). 3 P.M., clinical and pathological conference (surgical). 4.30 P.M., Dr. C. H. Andrewes: Recent Work on Viruses.
THURSDAY.—2.15 P.M., Dr. Duncan White: radiological demonstration. 3.30 P.M., Mr. Victor Bonney: Malignant Neoplasms of Uterus.
FRIDAY.—2 P.M., clinical and pathological conference (obstetrics and gynæcology).
Daily, 10 A.M. to 4 P.M., medical clinics, surgical clinics and operations, obstetrical and gynæcological clinics and operations.

HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C.
THURSDAY.—2 P.M., Mr. H. C. Apperly: The Milk Teeth. 3 P.M., Dr. Alan Moncrieff: Causes and Diagnosis of Enlarged Cervical Glands.
Out-patient clinics daily at 10 A.M. and ward visits at 2 P.M.

HOSPITAL FOR EPILEPSY AND PARALYSIS, Maida Vale, W.
THURSDAY.—3 P.M., Dr. Blake Pritchard: clinical demonstration.

ST. MARY'S HOSPITAL, W.
TUESDAY.—5 P.M. (Institute of Pathology and Research), Dr. Donald Hunter: Observations on the Toxicology of Certain Compounds of Lead, Arsenic, and Mercury.

NATIONAL HOSPITAL FOR DISEASES OF THE HEART, Westmoreland-street, W.
TUESDAY.—5.30 P.M., Dr. Paul Wood: Pericarditis.

FELLOWSHIP OF MEDICINE AND POSTGRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.
MONDAY to SUNDAY.—MAUDSLEY HOSPITAL, Denmark-hill, S.E., afternoon course in psychological medicine.—SATURDAY and SUNDAY.—INFANTS HOSPITAL, Vincent-square, S.W., course in children's diseases.

ST. JOHN CLINIC AND INSTITUTE OF PHYSICAL MEDICINE, Ranelagh-road, S.W.
FRIDAY.—4.30 P.M., Dr. G. T. Calthrop: Radiography in Physical Medicine.

MANCHESTER ROYAL INFIRMARY.
FRIDAY.—4.15 P.M., Dr. William Brockbank: clinical demonstration.

Appointments

CRAN, E. M., M.B. Aberd., Junior Assistant Medical Officer at the City General Hospital, Plymouth.
DOBBS, R. H., M.B. Camb., M.R.C.P. Lond., Hon. Physician to the Children's Department of St. John's Hospital, Lewisham.
HARDY, A. J., M.R.C.S. Eng., Assistant Medical Officer at the City General Hospital, Plymouth.
MACKEITH, S. A., M.R.C.S. Eng., D.P.M., Hon. Consulting Physician in Charge of the Department of Psychological Medicine at Warneford General Hospital, Leamington Spa.
MCKENZIE, W. S., M.B. Camb., Registrar and Clinical Tutor at the Central London Throat, Nose, and Ear Hospital.
PAYTON, C. G., M.D. Birm., M.B. Edin., D.P.H., Assistant County Medical Officer for Dorset.
WYNTER, TAMSIN M., M.D. Lond., D.A., Anæsthetist to the Department of Neurosurgery at the London Hospital.

London County Council Hospital Staff.—The following promotions are announced. D.M.S. = Deputy Medical Superintendent, A.M.O. = Assistant Medical Officer, (I) or (II) = Grade I or II:—
JEMSON, JAMES, F.R.C.S. Eng., D.M.S. (I), St. Alfege's;
JONES, A. N., M.B. Liverp., F.R.C.S. Eng., D.M.S. (II), St. Pancras;
KARRAN, C. W. C., M.B. Camb., D.C.O.G., A.M.O. (I), Park;
CHRISTIE, A. B., M.B. Aberd., D.P.H., A.M.O. (I), Eastern;
HALL, H. W., M.B. Edin., D.P.H., A.M.O. (I), Brook; and
SETTLE, H. L., M.B. Manch., A.M.O. (I), Grove.

St. George's Hospital.—The following appointments are announced:—
BURNS, B. H., B.Chir. Camb., F.R.C.S. Eng., Surgeon;
PINCKNEY, CHARLES, M.B. Camb., M.R.C.P. Lond., Physician in Charge of the Children's Department; and
ROBSON, KENNETH, M.B. Camb., M.R.C.P. Lond., Assistant Physician.

Certifying Surgeons under the Factory and Workshop Acts: Dr. J. T. MURPHY (Cullompton District, Devon); Dr. G. S. CHRISTIE (Fordoun District, Kincardine); Dr. A. S. BEER (Thame District, Oxford); Dr. W. E. S. MORETON (Reynoldston District, Glamorgan); Dr. J. C. CHRISTIE (Perth District, Perth); Dr. J. H. FISHER (Abingdon District, Berks); Dr. J. P. LOGAN (Kelvedon District, Essex).

Medical Referee under the Workmen's Compensation Act, 1925: A. H. VISICK, M.B., B.S., F.R.C.S., of York, for the Harrogate, Ripon, Tadcaster, Helmsley, and York County Court Districts (Circuit No. 14).

Births, Marriages, and Deaths

BIRTHS

DEBENHAM.—On April 10th, at Addison-road, W., the wife of Dr. Gilbert Debenham—a son.
HOUGHTON.—On April 15th, at Berkhamsted, the wife of Mr. L. Wynn Houghton, F.R.C.S.E.—a son.
PRYCE.—On April 7th, at Welbeck-street, W., the wife of Dr. D. Merlin Pryce—a son.
SADLIER.—On April 14th, the wife of Dr. H. W. Sadlier, Buxted, Sussex—a daughter.
STEVENS.—On April 13th, the wife of Mr. T. Russell Stevens, F.R.C.S., of Dorchester—a daughter.
THOMAS.—On April 15th, at Reading, the wife of Dr. Clifford Thomas—a son.
WALLACE.—On April 10th, the wife of Dr. Caleb Paul Wallace, of West Clandon, Surrey—a son.

MARRIAGES

EDKINS—HOWLAND.—On April 9th, in London, John R. P. Edkins, M.D., to Kathleen Howland.
HINKSMAN—WILLIS.—On April 14th, at Bloomsbury Baptist Church, John Forrest Hinksman, M.B. Edin., to Marjory Edith, daughter of the late Rev. R. Elgar Willis, of Ipswich.

DEATHS

BANISTER.—On April 16th, John Bright Banister, M.D. Camb., F.R.C.P. Lond., F.R.C.S. Edin., F.C.O.G., of Berkeley Court, N.W., and Manor House, Tatsfield.
FOSTER.—On April 13th, Claud Sanderson, L.M.S.S.A. Lond., of St. George's-road, S.W., and of Worthing, aged 63.
GRABHAM.—On April 13th, at Quinta do Val, Madeira, Michael Grabham, M.B., B.Chir. Camb., elder son of the late Dr. Michael Grabham, aged 71.
HILL.—On April 18th, at Henley, Surgeon Vice-Admiral Sir Robert Hill, K.C.B., K.C.M.G., C.V.O., F.R.C.S. (Eng. and Edin.), in his 72nd year.
JOYCE.—On April 17th, at Nice, John Hall Joyce, M.B. Camb., aged 69.
MCGREGOR.—On April 15th, at Torquay, John McGregor, M.D. Glasg., formerly of Ayr.
STRANAGHAN.—On April 19th, at Bournemouth, Cyril Patrick Andrew Stranaghan, M.B. Edin.
SURRIDGE.—On April 17th, at Wenden, Saffron Walden, Edward Ernest North Surridge, M.B. Camb., aged 73.
TRUMAN.—On April 14th, at Upton, Slough, Charles Edwin Truman, M.R.C.S., L.D.S., Governor of St. Thomas's Hospital, late Surgeon-Dentist to His Majesty's Household, in his 89th year.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

NOTES, COMMENTS, AND ABSTRACTS

NOISE AND ITS CONTROL

ONE of the most irritating of the minor evils of civilised life is noise. Hogarth's Enraged Musician would probably have been even more exasperated had he lived in the twentieth century instead of the eighteenth. Yet with the exceptions of Helmholtz and the late Lord Rayleigh, physicists for many years paid little attention to sound. The omission is rapidly being made up, largely because of the facilities for production of sounds of well-defined intensity as well as frequency afforded by developments arising out of radio reception. The National Physical Laboratory has for some years taken an interest in the measurement and control of sound, and in its report for 1937 (H.M. Stationery Office, 2*s*. 6*d*.) some account is given of work done with a standard objective noise meter, designed at Teddington. The determination of equivalent loudness in terms of the "phon" was based fundamentally on subjective observations, involving a number of observers and a technique suitable only to the laboratory, but an instrument consisting of microphone, amplifier, and rectifier has been devised in which the overall response to pure tones is so adjusted that, at the loudness of conversation and above, it gives equal reading for pure tones which appear equally loud to the ear, irrespective of pitch. "The freedom of objective meters from personal bias renders them of particular value as arbiters where it is desired to control noise by fixing an upper limit to the loudness permitted in given circumstances." With such a meter the investigation both of noise itself and of means of deadening it can be based on a rational quantitative basis, and the laboratory has carried out several investigations in both directions.

Mention has already been made in these columns (March 12th, p. 624) of the inquiry into motor-horn noises over which Dr. Kaye presided. With the aid of some 200 listeners of both sexes, and of ages between sixteen and sixty, an attempt was made to assess the annoyance value of motor-horns of all kinds to persons in their vicinity, as well as to evaluate the effectiveness of horns under normal conditions of use. It appeared that while no single measurable characteristic of a horn serves entirely to determine its objectionableness, the loudness of the sound is of major significance. A loudness of 95 to 100 phons at a distance of twenty feet annoys the average observer, but the driver of a moderately noisy vehicle appears to require a loudness of the order of 105 phons for adequate warning from overtaking vehicles. The committee of the Ministry of Transport for which this work was undertaken recommended that, under specified conditions of test, the noise of a motor-horn should not exceed 100 phons at a distance of twenty feet.

Much work has been done on the acoustics of buildings, both from the point of view of the willing listener in concert-rooms, church, or lecture-room and that of the flat-dweller or other listener to undesired noise. Experiments on the sound insulation of walls, floors, and ceilings have been made, some in experimental structures and others in actual buildings. The sound-transmitting properties of screens used for talking pictures have also been studied, and also means of impeding the transmission of sound along water-pipes.

Among the many investigations carried out at Teddington, these on sound seem to be of special interest to the medical profession, who in their consulting-rooms need both absolute privacy and freedom from external noise, and who, in the homes of their patients and in the public streets, see much of the nervous irritation and retarded recovery caused by excessive noise. Double windows, floors "floating" on rubber blocks more than an inch above the structural floor, and inner wall facings fixed to battens held in insulating clips have been found efficient for sound insulation of rooms. The insulating value of non-porous partitions is determined mainly by their weight, which tends to limit their applicability in buildings of light construction. The outer green baize doors of some consulting-rooms would seem to be an effective means of decreasing the sounding-board effect of the weakest part of the sound insulation of rooms.

WHY SURGEONS BECAME SURGEONS

IN 1910 Dr. Francis Reder of St. Louis, in collecting material for an address on "The Surgeon and his Work," wrote to fifty outstanding surgeons throughout the world inquiring why they became surgeons. The reasons given by the thirty-nine who replied included natural inclination from childhood (Sir John Bland-Sutton) and parental example (the brothers Mayo), admiration of a particular teacher or the family doctor, personal experience of surgical intervention, a natural taste for the tangible benefits of surgery to humanity (Sir Victor Horsley), and the more banal consideration of a fortuitous surgical opening. Dr. Reder tells us he has now presented these letters to the St. Louis Medical Society for preservation.

THE ROYAL BERKSHIRE HOSPITAL

A HUNDRED years ago the Royal Berkshire Hospital at Reading was being built. A year before its builder had begun to dig out the foundations, and a year later it was formally opened. The hospital has marked its centenary by the publication of a history[1] of its foundation and subsequent growth, the proceeds of which will go to the centenary appeal fund. The story is one of smooth and efficient progress. The hospital was founded at a time when money was plentiful and advances in medicine and surgery sufficiently dramatic to catch the public eye, and its expansion has run parallel with that of the district which it serves.

Like most provincial towns Reading had little in the way of medical service for the poor until the beginning of the nineteenth century, when there was a general awakening to the need for social development and for improvements in the public health. In 1802 the Reading Dispensary was founded in a building in Chain-street formerly occupied by a school. This was a highly popular institution, but it dealt only with out-patients, and by 1830 the demands made upon it were more than it could cope with. At that time a Mr. Richard Oliver, among others, made persistent efforts to arouse local interest in the establishment of a general hospital, and walked more than once to Windsor to interview William IV on the subject. In February 1836 the governors of the dispensary at last decided to devote their accumulated surplus of £5000 to the erection of a hospital. They had no lack of support from the town and district and the King and Queen agreed to be patrons of the new institution, a royal interest which has continued to the present day and is now shown by the signature of Queen Mary in the present history. Lord Sidmouth presented the building committee with five acres of his Early Court estate, and by April, 1837, a design had been approved, a tender of £6450 accepted, and construction began. It was intended that Lord Sidmouth should lay the foundation-stone on May 13th, but his ill health led to the ceremony being postponed and it was ultimately cancelled altogether because of the death of William IV on June 20th. The £12,000 which the hospital and its equipment was expected to cost was soon oversubscribed, and indeed the sole opposition came from the weather, which damaged the stone at the quarries and made the canals impassable. However, on May 27th, 1839, the building was ready to take its

[1] Story of the Royal Berkshire Hospital, 1837–1937. Edited by Ernest W. Dormer. Reading: The Poynder Press. Pp. 187.

first patients. Two thousand Sunday-school children led an opening procession, twenty-nine toasts were duly drunk at a dinner at the Town Hall, and at last the hospital was opened.

In a hundred years the hospital has steadily expanded by the addition of special departments, a nursing-home for patients of moderate means, a convalescent home at Calcot, new operating theatres and the like, and the original 50 beds have become 350, but further building, which will cost £150,000, is necessary if it is to keep pace with modern requirements.

WATCHING CHILDREN AT PLAY

IN 1931 Miss D. E. M. Gardner organised a play centre for children in the Leeds Training College for Teachers with the object of providing opportunities for play for a limited number of children from poor and crowded homes. The experiment has been more than successful, for the play centre now forms an integral part of the college life and is open on four evenings a week to over 100 children between the ages of 3 and 14. The centre fulfils a double purpose, for it not only provides opportunities for children to play in an atmosphere of friendship and security essential to their normal development but it forms a valuable part of the school teacher's training. Miss Gardner tells us in a little book [1] how quickly the children respond to the opportunities offered them; how backward children are able to develop and become useful members of the centre, and how the unstable children respond to association with other children as well as to the sympathetic atmosphere of the centre. The accounts of group play activities, particularly of dramatic work, make interesting reading. The student has ample time to observe children playing spontaneously and to apply psychological principles learnt in the lecture rooms. She can watch for differences in the type of play normal for each age level and thus pick out abnormal children; and she can also gain experience in the handling of large groups of children. Miss Gardner has shown wisdom in allowing the needs of both children and students to determine the choice of material and the types of activity in the play centre, and it is to be hoped that other training colleges will follow her example.

DIET AND HEALTH—FOR THE LAYMAN

IN one of the many little books nowadays prepared for that apparently omnivorous reader the intelligent layman, Dr. Morris Fishbein [2] discusses in non-technical language such questions as calories, the cost of food and foodstuffs and diets for various ages and conditions. The chapter debunking fashionable and faddish diets is to be commended especially to the laywoman, not necessarily intelligent, who prefers emaciation, or something akin to it, to emancipation. The frivolous sketches that enliven the book are in strange contrast to the text, for Dr. Fishbein takes his, and our, food very seriously. He comments severely, for instance, on Marie Antoinette's famous remark, "Let them eat cake," the significance of which is not usually held to lie in its literal message. "That was bad advice," he says. "A slice of bread costs less than a piece of cake of the same size and offers more in the way of nutritional elements." Numerous dietetic charts and detailed weight-reducing menus are appended. It is difficult to call to mind any topic about which more clap-trap is talked and written than dietetics, and it is refreshing to find here a simple and sane account of diet and health.

[1] The Children's Play Centre. By D. E. M Gardner, Lecturer in Education at the City of Leeds Training College. London: Methuen and Co. 1937. Pp. 143. 3s. 6d.

[2] Your Diet and Your Health. By Morris Fishbein, M.D., Editor, Journal of the American Medical Association; Editor, Hygeia, the Health Magazine. London: McGraw-Hill Publishing Co. 1937. Pp. 298. 10s. 6d.

NEW PREPARATIONS

NICOTINIC ACID B.D.H.—Elsewhere in this issue will be found a paper from Cincinnati, and a clinical note from University College Hospital, on the use of nicotinic acid in pellagra. Dr. Spies and his colleagues are satisfied that this substance is an antipellagric factor, capable of removing mucous membrane lesions and of restoring strength; but in the *Journal of the American Medical Association* of April 2nd (p. 1081) Spies suggests that the peripheral neuritis often associated with the disease should be treated by injection of vitamin B_1. The British Drug Houses Ltd. (City-road, London, N.1) issue Nicotinic Acid B.D.H. in tablets to be taken by mouth, each tablet containing 30 mg. of the acid.

PRESTOBAND is the name given to a new surgical bandage. It looks like an ordinary cotton-gauze bandage, but the material has been treated so as to make it self-adhesive—i.e., it will stick to itself but not to skin or hair. The self-adhesion simplifies application, since no knots or pins are required, and the dressing will usually be less bulky and more effective for its size. Prestoband gives more support than ordinary gauze and, when applied to a finger for example, is not disturbed by washing. The makers are Vernon and Co., Ltd., Penwortham Mills, Preston, Lancs, but the bandages are supplied only through trade channels.

TAR DERMAMENT is a combination of an alcohol-soluble phenolic resin, having analgesic properties, with 6 per cent. of washed crude coal-tar. It is described as relatively non-toxic, mildly anæsthetic, and slightly vasoconstrictor. When it is painted on the skin the solvent evaporates leaving a covering of the resin which holds the tar at the place of application, and ensures direct and continuous contact of the antiseptic with the area under treatment. The makers (Parke, Davis and Co., Beak-street, W.1) recommend it for eczema, seborrhœa, psoriasis, pruritus, and other disorders of the skin.

ENTACARB POWDER, made by Reed and Carnrick (Canada) Ltd., Toronto, is intended for the treatment of gastric hyperacidity and each teaspoonful is said to contain approximately: calcium carbonate 15 grains, magnesium carbonate 6, sodium bicarbonate 3, potassium bicarbonate ½, colloidal aluminium silicate 12, and bismuth subcarbonate 2. "Calcium is the chief alkalising agent. Magnesium, sodium and potassium salts are added in the proper proportions to bring about a prompt neutralising effect and a gentle laxative action." The calcium is held to have an antispasmodic action, and the bismuth and aluminium silicate are locally soothing. Besides Entacarb Powder the manufacturers sell coated Entacarb Tablets which break up in the duodenum and are meant for general alkalisation. The distributors in Britain are Coates and Cooper Ltd., 94, Clerkenwell-road, E.C.1.

We have received from the ARMOUR LABORATORIES (Armour House, St. Martin's-Le-Grand, E.C.1) a booklet describing their "Glanoid" Anterior Pituitary Factors, which are standardised physiologically. Those available are a growth factor, gonadotropic ("maturity") factors, a lactogenic factor (prolactin), a thyrotropic factor, an adrenotropic factor, and a polyvalent extract (Polyansyn) said to contain all the hormones of the anterior pituitary. It is emphasised that these products are not "anterior pituitary-like" preparations, but are obtained only from the anterior lobe of the pituitary gland.

A small book on the Treatment of Neurosyphilis and Trypanosomiasis with Tryparsamide has been prepared by PHARMACEUTICAL SPECIALITIES (MAY AND BAKER) LTD. (Dagenham, Essex). Copies may be had on application.